Tratamiento Médico del Empiema

6º Congreso Argentino de Neumonología Pediátrica

Htal. Gral. de Niños
Dr. Pedro de Elizalde

22 Noviembre 2012

Comisión de Empiema – 1914

Mortalidad 70 %

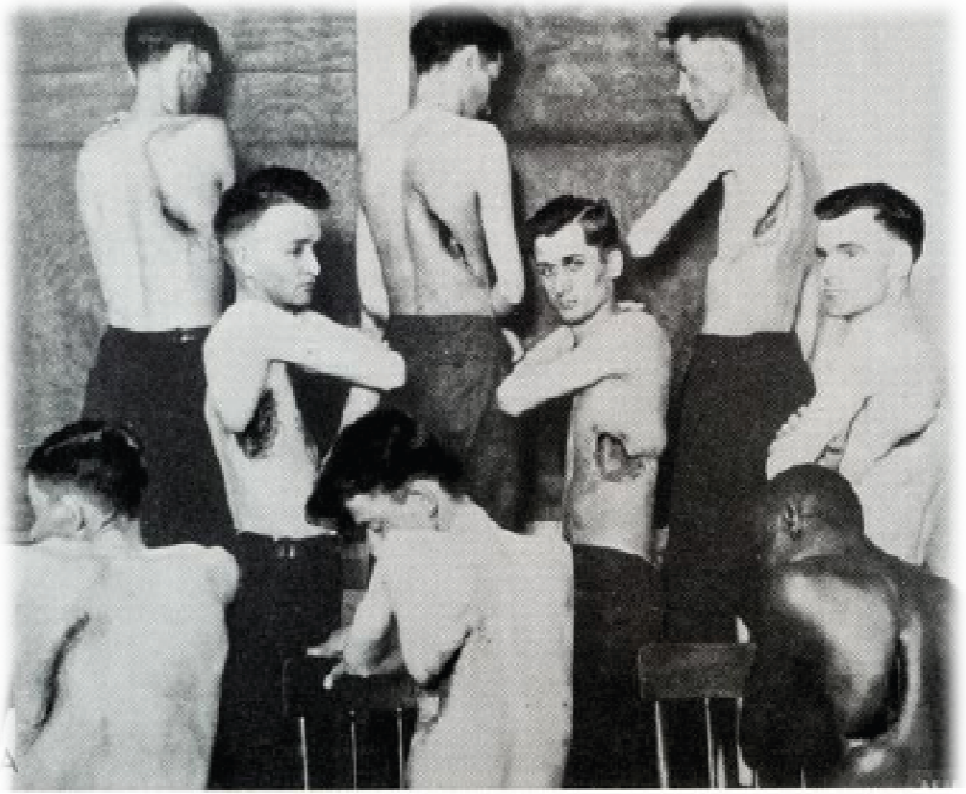


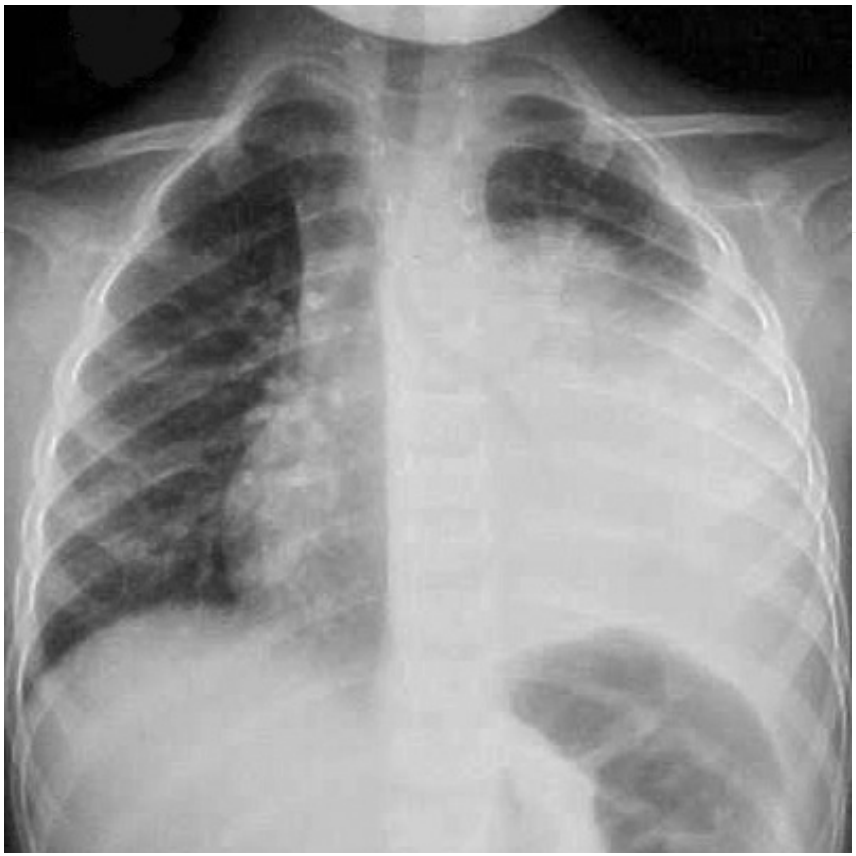
FIGURE 109.—Comparative results of management of empyema in World Wars I a
A. Typical patients with chronic empyema in Zone of Interior hospitals in Wor
or I (2).

Thanks to PENICILLIN
...He Will Come Home!

Empyema in children; a twenty-five-year study

B Lionakis, S Gray, J Skandalakis J Pediatr 53(6):719-25 (1958)

Parece probable que este estudio abarque el período de la extinción práctica del empiema como una enfermedad importante



De 210 niños ingresados con derrame pleural, demostraron que el 68% de los derrames son paraneumónicos y el 32% empiema en USA

Hardie W, Bokulic R, Garcia VF, et al. Pneumococcal pleural empyemas in children. *Clin Infect Dis*. Jun 1996;22(6):1057-63

Empiema se informó en aproximadamente 0.6-2% de los niños con neumonía bacteriana

Chonmaitree T, Powell KR. Parapneumonic pleural effusion and empyema in children. Review of a 19-year experience, 1962-1980. *Clin Pediatr (Phila)*. Jun 1983;22(6):414-9
Mocelin HT, Fischer GB. Epidemiology, presentation and treatment of pleural effusion.*Paediatr Respir Rev*. Dec 2002;3(4):292

El 2.4% tuvieron neumonia complicada con empiema

Community-acquired pneumonia (CAP) in children in Oslo, Norway
Senstad et al
Acta Paediatrica Volume 98, Issue 2, pages 332–336, February 2009

The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America (IDSA)

John S. Bradley,1,a Carrie L. Byington,2,a Samir S. Shah,3,a Brian Alverson,4 Edward R. Carter,5 Christopher Harrison,6 Sheldon L. Kaplan,7 Sharon E. Mace,8 George H. McCracken Jr,9 Matthew R. Moore,10 Shawn D. St Peter,11 Jana A. Stockwell,12 and Jack T. Swanson13

Clinical Infectious Diseases Advance Access published August 301, 2011

Un estudio prospectivo en niños realizado en Europa y América sobre neumonía adquirida de la comunidad demostró que el empiema se presentó entre un 2% y un 12%

Boletín oficial 2010 Ministerio de Salud, Argentina

Total 37.602 Neumonías en niños

Estimación de Neumonía complicada	2 % al 6 %	752 – 2256 pac.
	12 %	4512 pac.

La tasa de mortalidad fue de 3.68 % 1.387 niños fallecidos por esta enfermedad

Treatment of Complicated Parapneumonic Pleural Effusion With Streptokinase Intrapleural in Children*

CHEST *Chih-Ta Yao* 2004

Surgery, No. of patients/total 2 / 20

Drainage, Fibrinolytics, or Surgery: A Comparison of Treatment Options in Pediatric Empyema

Robert L. Gates, Mark Hogan, Samuel Weinstein, and Marjorie J. Arca *Columbus, Ohio*

Journal of Pediatric Surgery, Vol 39, No 11 (November), 2004: pp 1638-1642

Estudio con 52 pac.

Treatment of encapsulated pleural effusions in children: a prospective trial.

Kobr J, Pizingerova K, Sasek L, Fremuth J, Siala K, Racek J. Pediatr Int. 2010 Jun;52(3):453-8. Nov 16.

Prospective study, 76 consecutive children (average age 5.0 +/- 4.14 years)

Neumonía Complicada con Empiema

Período 11 años 2001 / 2012 905 pac

Primer Período Septiembre 2001 / Agosto 2005

AÑO	Empiemas	VT- VATS	STK
2005	89	14	49
2004	76	6	27
2003	62	15	15
2002	36	2	12

Total 103 casos

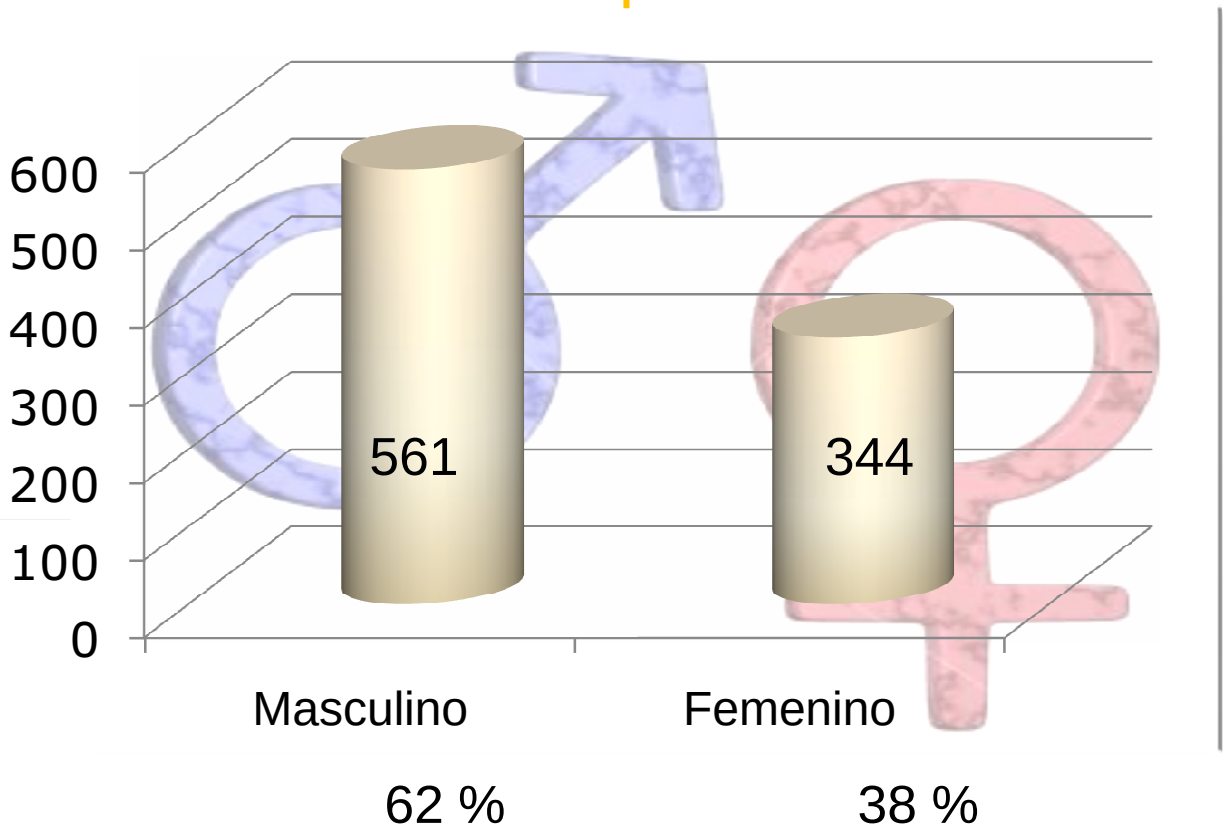
Clínicos

Cirujanos

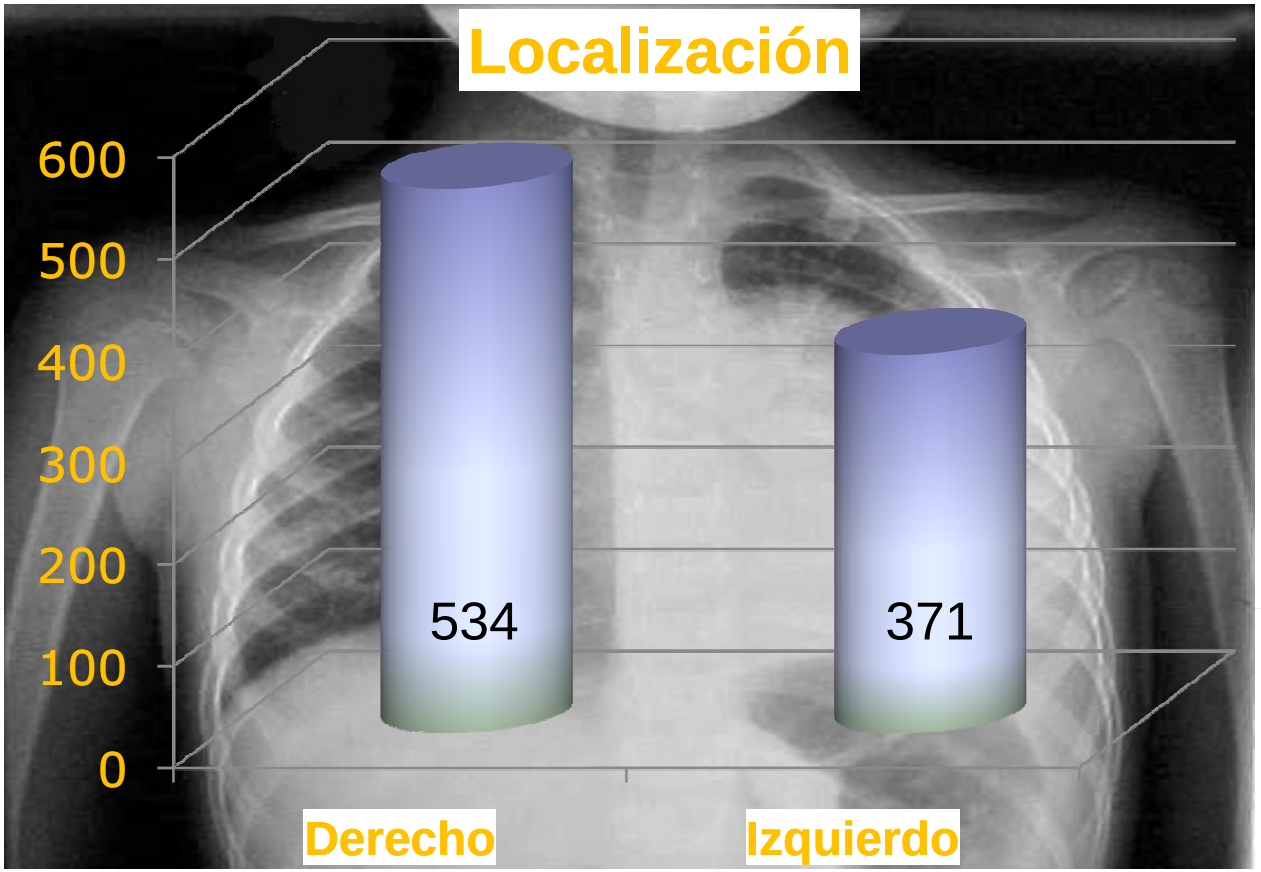
STK

Anestesistas

Distribución por sexos



n = 905

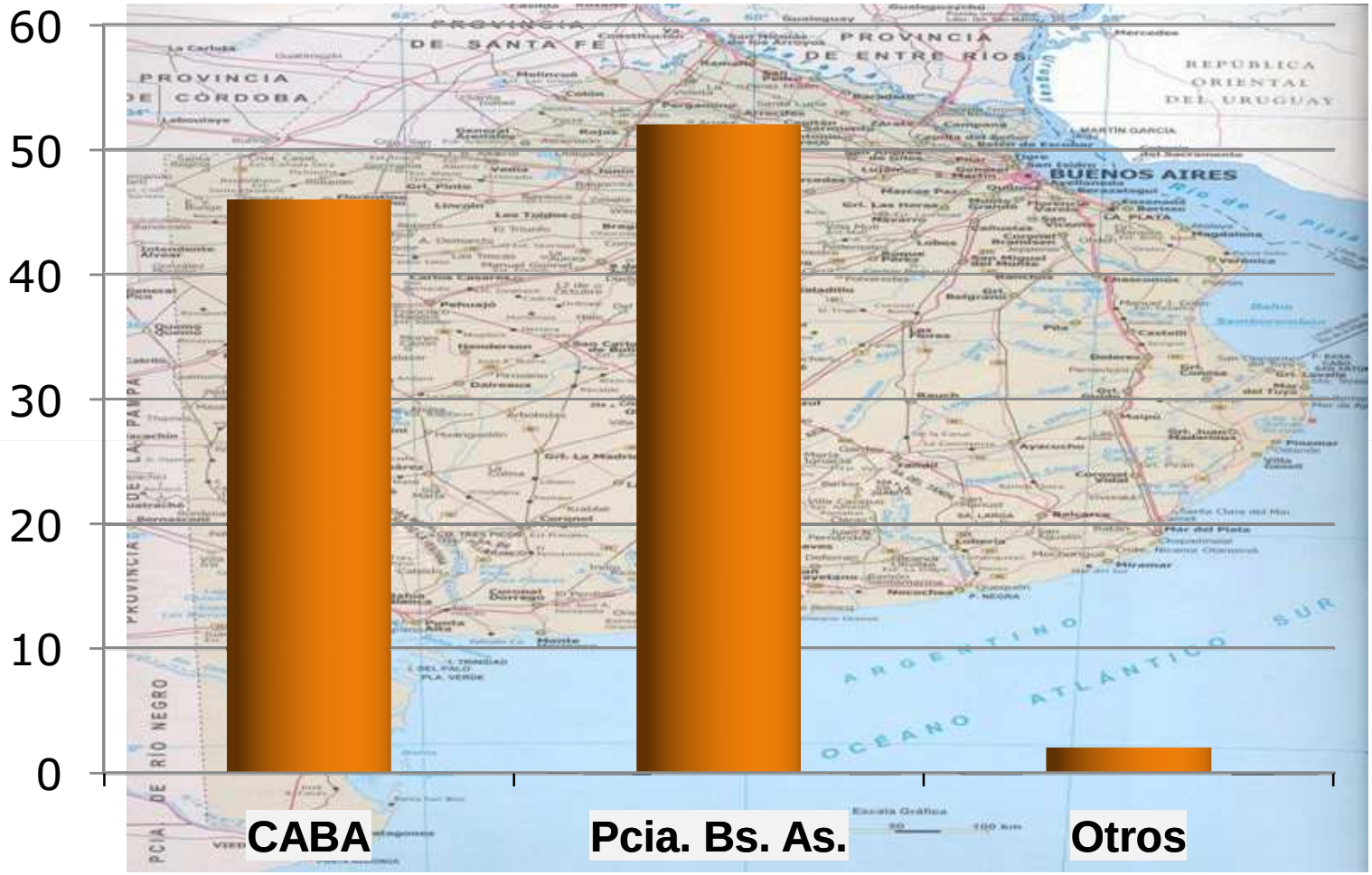

Localización
600
500
400
300
200
100
0
534
371
Derecho
Izquierdo

59 %

41 %

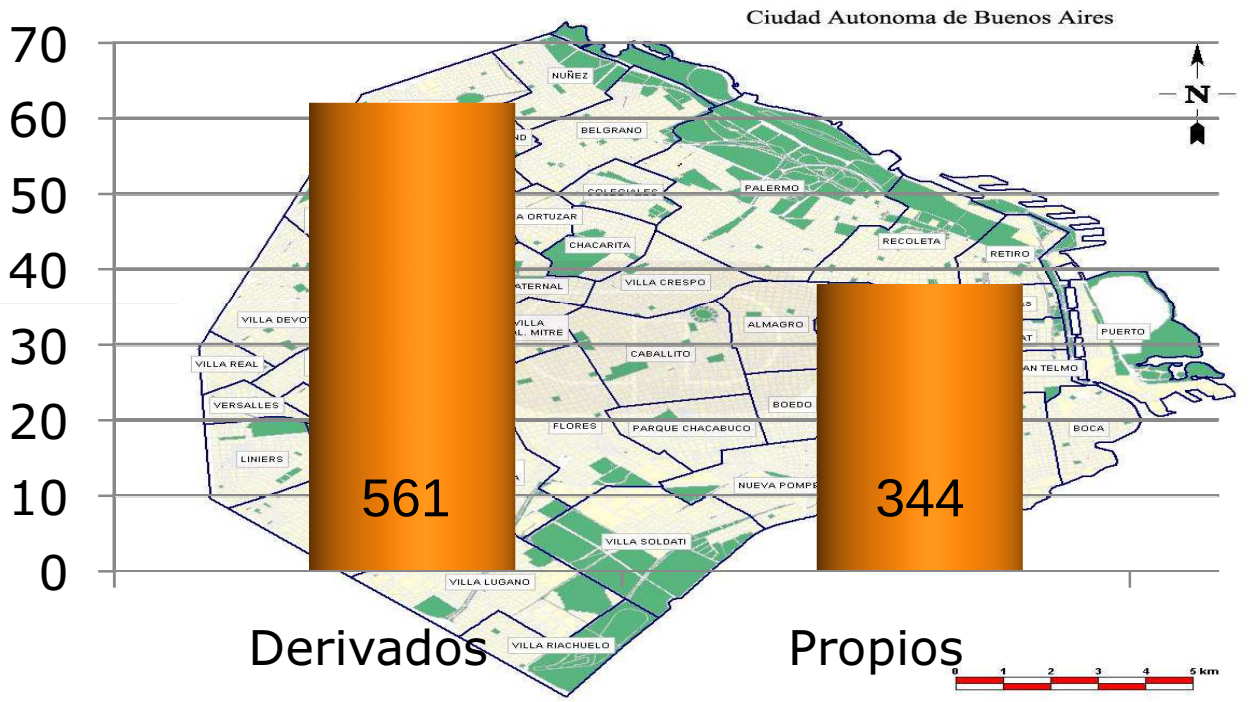
n = 905

Procedencia en %



n = 905

CABA

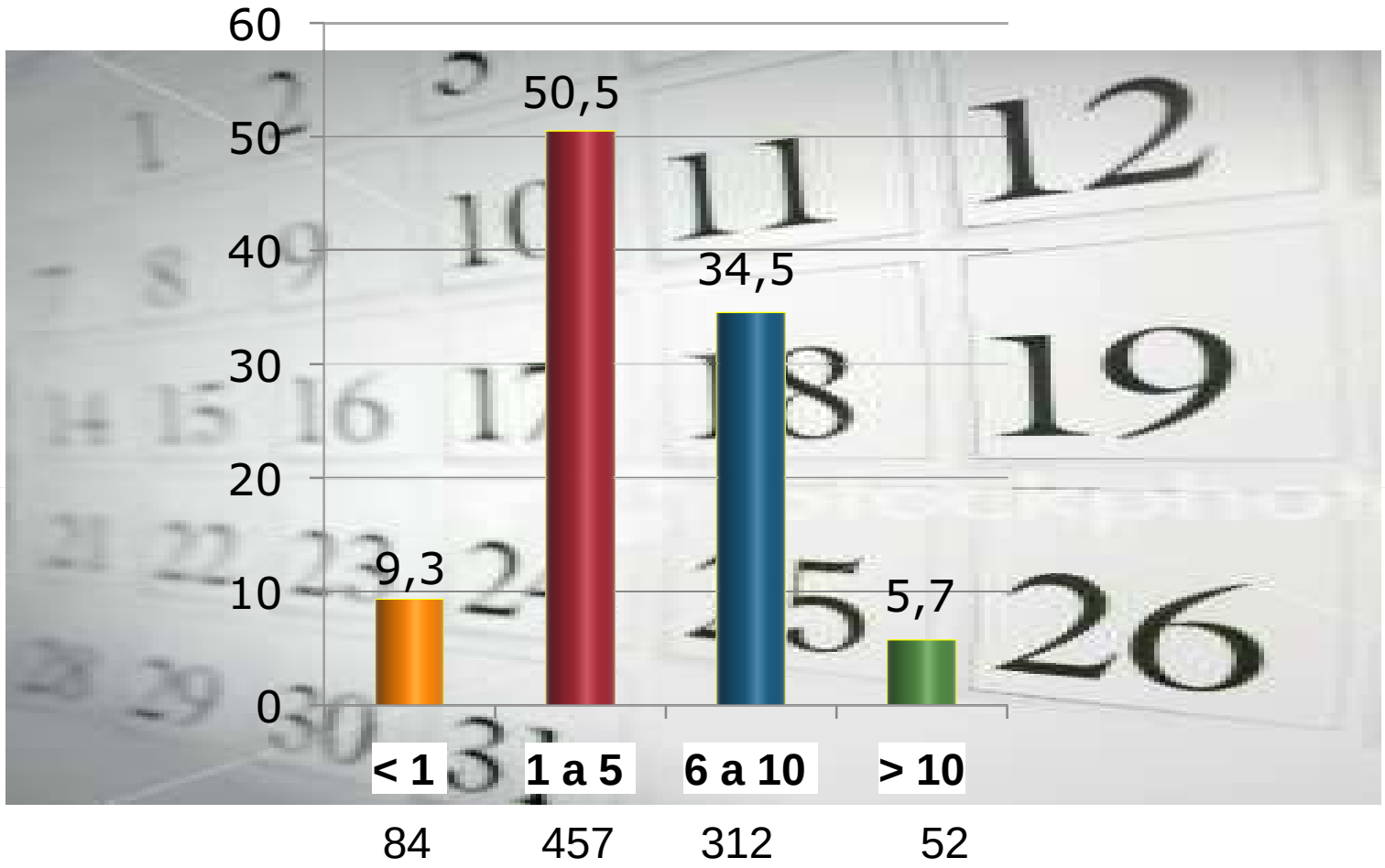


62 %

38 %

n = 905

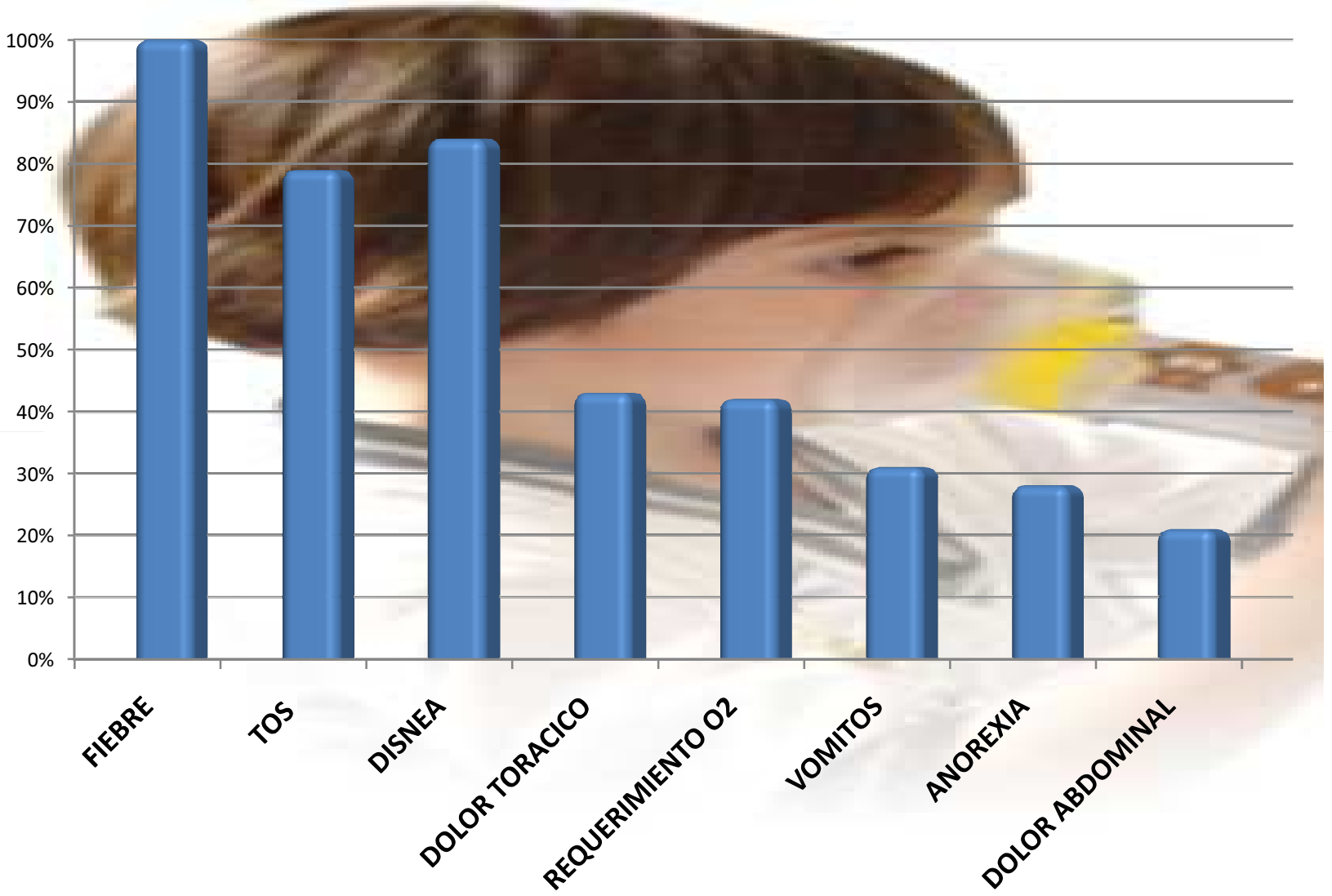
Edad



n =905

Edad
140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Síntomas


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
FIEBRE
TOS
DISNEA
DOLOR TORACICO
REQUERIMIENTO O2
VOMITOS
ANOREXIA
DOLOR ABDOMINAL

Radiografía de tórax

100 % de los casos de Frente

Limitaciones:

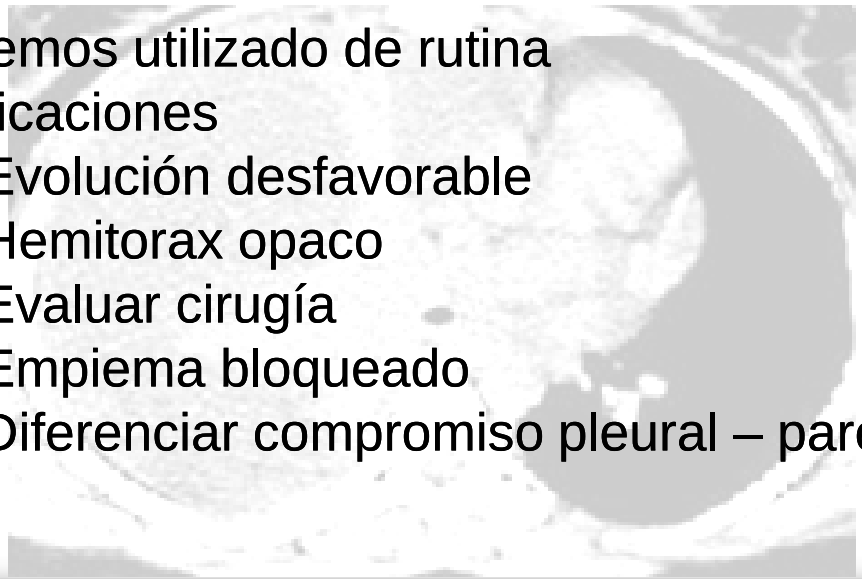
No es posible diferenciar el líquido de engrosamiento pleural

No es útil para estadificar la enfermedad

Ecografía -Tomografía

Ecografía pleural

Se realizó en todos los niños
Es la mejor técnica para diferenciar líquido pleural y consolidación
Estima tamaño, complejidad y grado del derrame
Demuestra presencia de septos de fibrina y
Guía colocación de drenaje torácico.



TAC

No la hemos utilizado de rutina

Indicaciones

- Evolución desfavorable
- Hemitorax opaco
- Evaluar cirugía
- Empiema bloqueado
- Diferenciar compromiso pleural – parenquimatoso - tumoral

Clasificamos en:

Grupo 1 (G I): pacientes con SPP que consultaron con <7 días de evolución.

Grupo 2 (G II): pacientes con SPP que consultaron o fueron derivados de otros centros entre los 8 y 14 días de evolución.

Grupo 3 (G III): pacientes con SPP con >15 días de evolución

Total n=905 (2001 / 2012)

G I	131	14.47 %
G II	475	52.48 %
G III	293	32.37 %

Correlación entre la ecografía y la imagen real de los tabiques

Opciones quirúrgicas terapéuticas

Toracocentesis seriadas

Tubos de drenaje comunes

Colocación de pequeños tubos (pig tail)

Video Toracoscopía

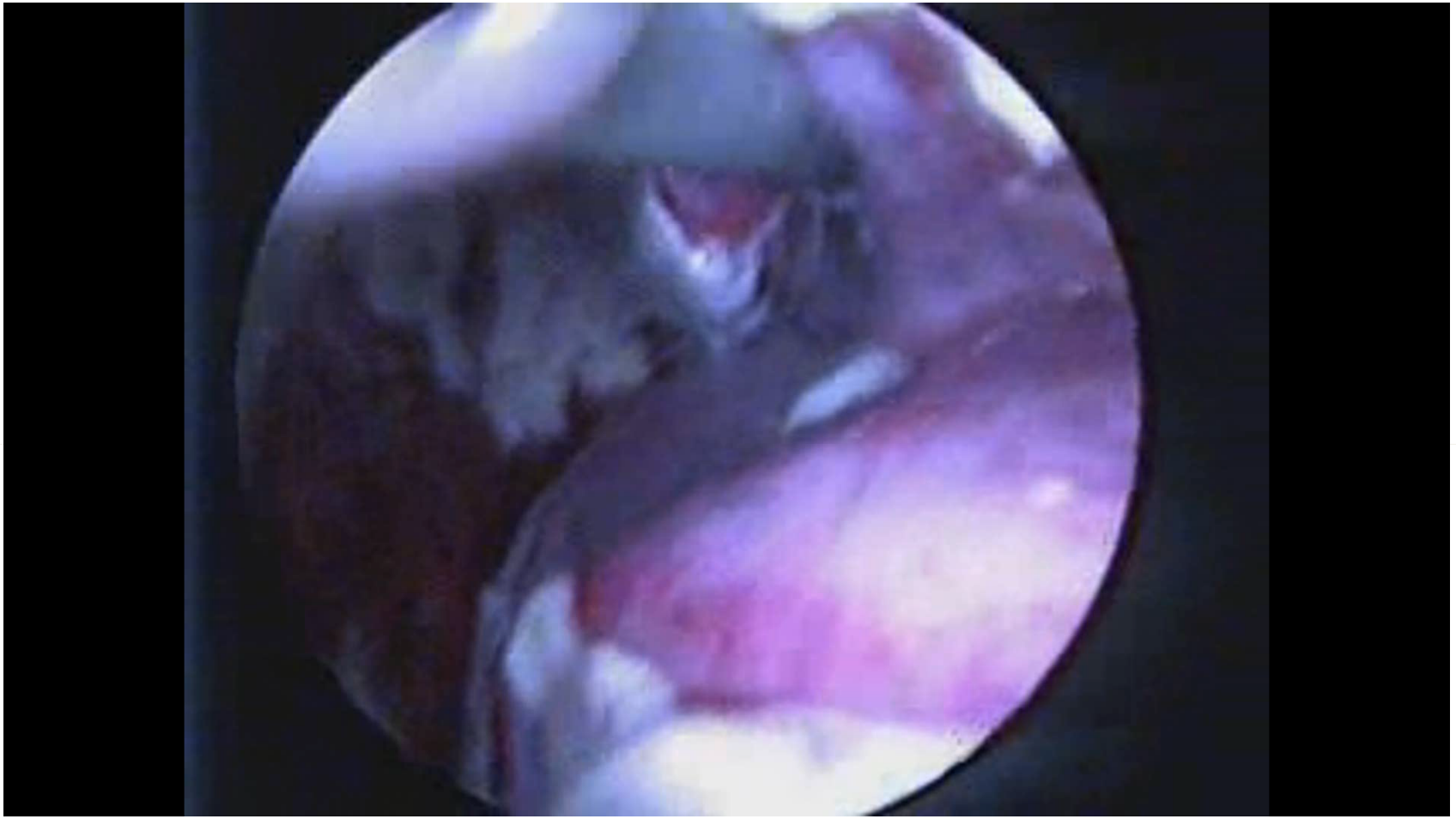
VATS

Toracotomía

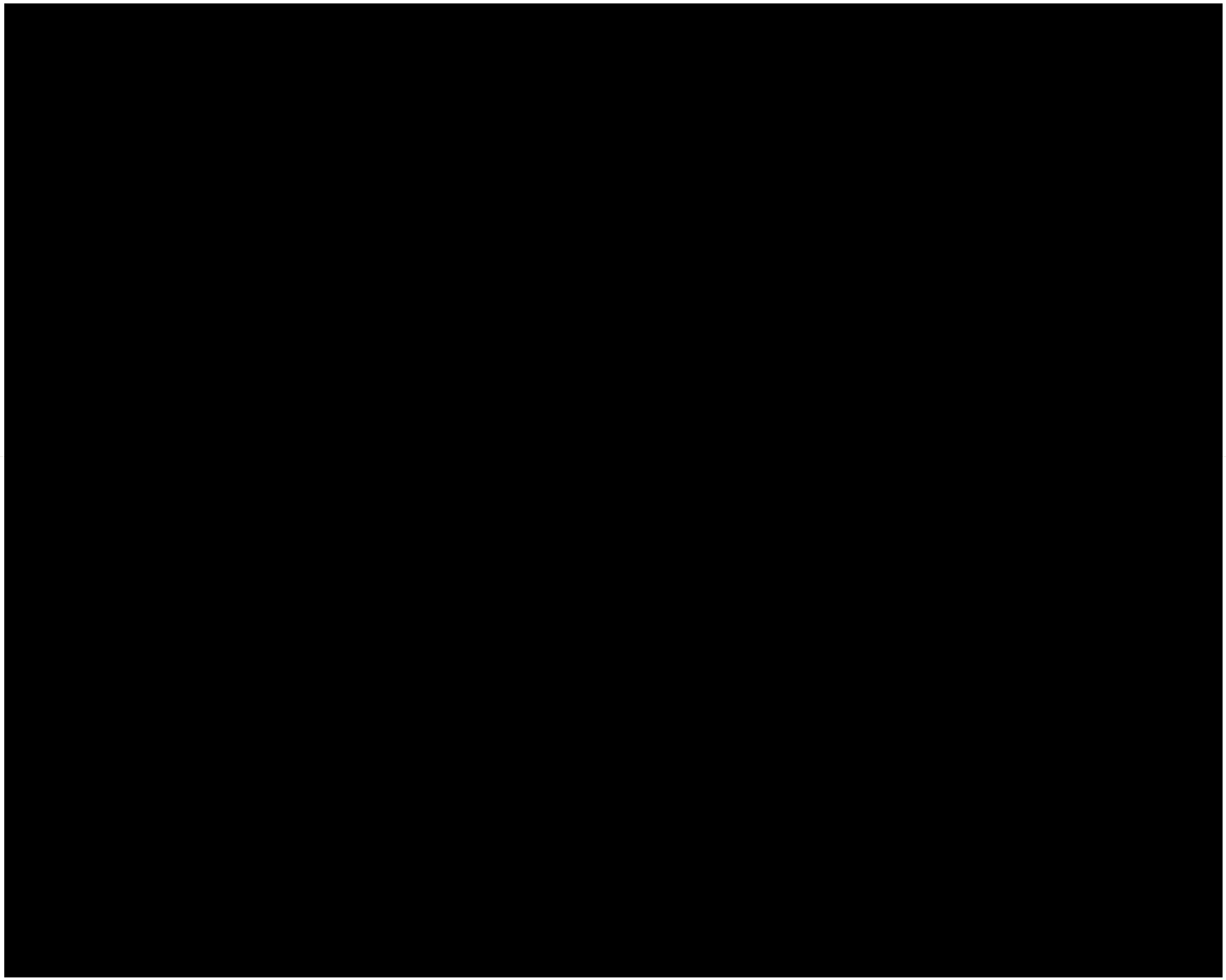
Decorticación

Fibrinoliticos

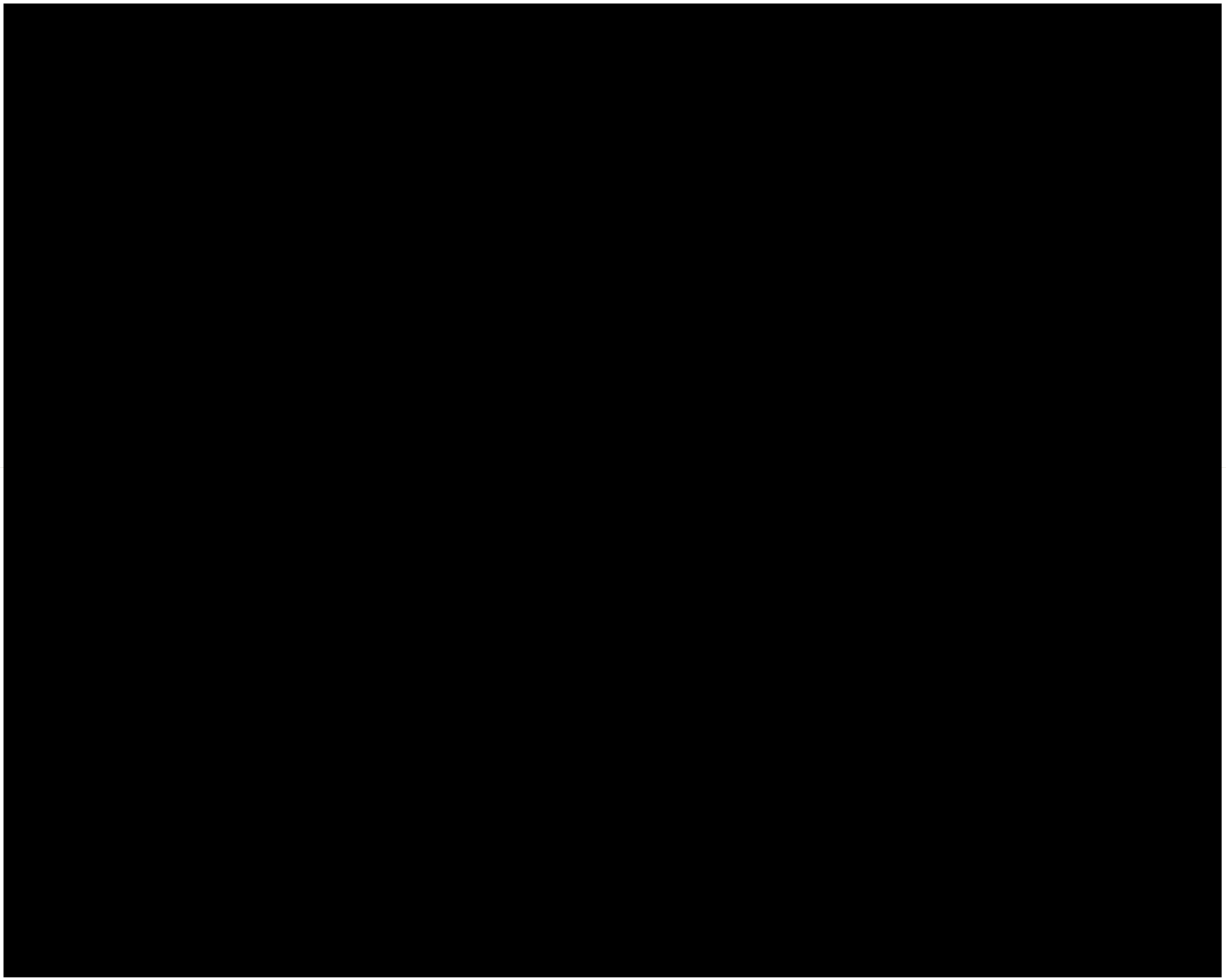
Video - toracoscopía



Cirugía Torácica Video Asistida - VATS

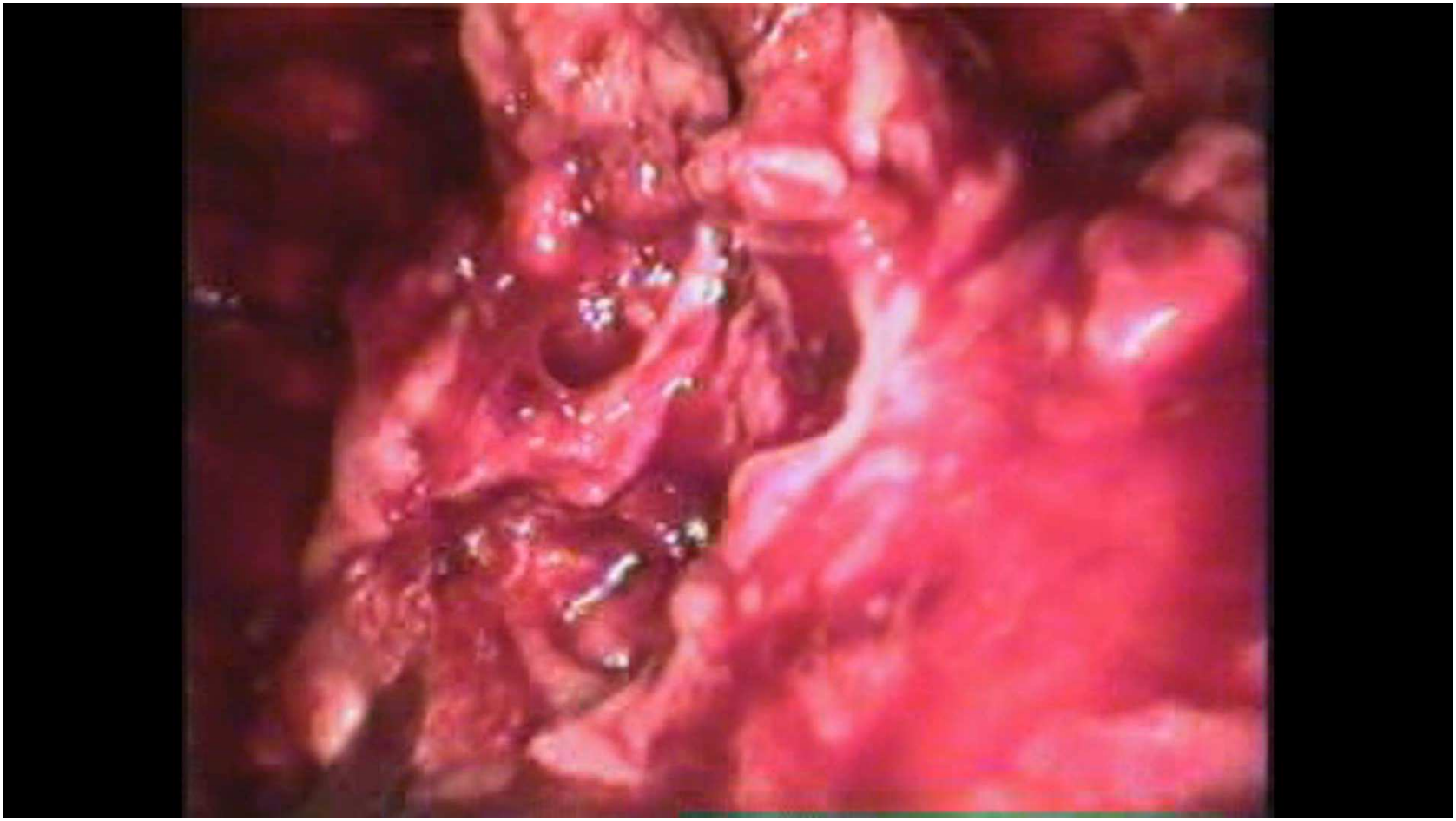


Cirugía Torácica Video Asistida - VATS



Toracotomía

Decorticación



STK

Líquido pleural

Aspecto purulento	Sólo Bacteriología		
Aspecto es citrino	Bacteriología + físico-químico	Sensibilidad	Especificidad
	Ph	68	95
	Glucosa	75	95
	LDH	77	65

Cultivo del líquido pleural

	Hemocultivo	Líquido Pleural Derivados
G I	23 %	35 % - 17 %
G II	18 %	21 % - 11 %
G III	6 %	3 % - 0 %

Streptococcus pneumoniae
Haemophilus influenzae tipo b
Micoplasma pneumoniae
Streptococcus grupo B
Staphilcoccus aureus MR
Chlamydia trachomatis
Streptococcus pneumoniae resistente
Otros

Total n=905 (2001 / 2012)

G I	14.47 %
G II	52.48 %
G III	32.37 %

Registro de datos

Protocolos pre impresos que incluían:

Datos del paciente: nombre, edad, sexo
Fecha de ingreso y egreso
Días de evolución
Sintomatología
Exámenes complementarios :
- oImágenes: Rx Ecografía TAC
- oLaboratorio: Hemograma Cultivos
- oTratamiento: ATB, Oxigenoterapia

Toracocentesis: Material obtenido: características, citoquímico y cultivo
volumen, drenaje, calibre
STK: dosis, días, débito
Clínica General
Retiro drenaje
Alta: estudios al alta

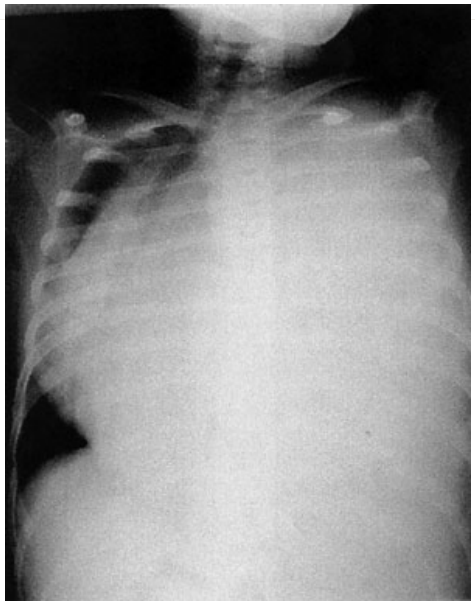
Empiema: Inclusión Protocolo STK

Debe cumplir con los siguientes requisitos

Enfermedad febril con la consolidación neumónica en el inicio

Líquido en el espacio pleural en la radiografía de tórax y ecografía

Líquido pleural turbio con células de pus y / o loculación en la ecografía



Drenaje tradicional

Drenaje pleural “pig tail”

Chest 1998; 114:1116-1121
Arch Dis Child 2002; 87: 331-332
Thorax 2002; 57: 343-347
Ped Pulm 2005;39: 127-134

Neumonía Complicada con Empiema

Segundo Período Septiembre 2005 / Agosto 2012 7 Años

	AÑO	N°	C /Fístula	VT-VATS	STK	
	2012	91	6		85	
	2011	81	7		74	
	2010	101	9		92	
642	2009	85	5		80	**594**
	2008	96	5		91	
	2007	90	7		83	
	2006	98	9		89	
	2005	89	-	14	49	
	2004	76	-	6	27	
	2003	62	-	15	15	
	2002	36	-	2	12	
	Total	905			697	

De un total de n=642 utilizamos STK en 594 92.52 %
(n=48 con fístula)

Total STK n=594 (2005 – 2012)		
G I	76	12.79 %
G II	340	57.23 %
G III	178	29.96 %

Se incluyeron

1 35 días
1 38 días
1 43 días

Se excluyeron pacientes drenados con más de 45 días de evolución y aquellos con fístula alvéolo pleural

STK

Dosis: 10000 UI / Kg / d hasta un máximo de 250000 UI

Presentación

250000 UI
750000 UI
1500000 UI Costo 2300 $ á 3000 $ (Htal. – Particular)

Preparación

Dilución 15 cc = 100000 UI / ml

Conservación

Jeringas prellenadas de 100000 UI c/u

En freezer = 6 meses

STK: Estabilidad de las diluciones conservadas a -25° C

Pigliapoco V, Bartoletti S, Giambini D, Balbarysky J. Aba Vol 74 2010

Modo de empleo

Se instila STK con 50 (100) cc de Solución fisiológica
Clampeo del drenaje durante 2 – 4 Hs cada 24 hs

Cantidad de líquido obtenido

Con débito positivo se administra STK (100 – 550 cc)

Suspende STK y Retiro del drenaje

débito es nulo

menor 40 cc en 24 Hs (1 ml/ Kg)

citrino

Días de uso de STK

n=594 (2005 – 2012)

1 día	18	3.04 %	13.30 %
2 días	61	10.26 %	49.83 %
3 días	217	36.53 %	77.77 %
4 días	166	27.94 %	94.94 %
5 días	102	17.17 %	
6 días	25	4.20 %	
7 días	5	0.86 %	
8 días	0	0.00 %	

G I	76	12.79 %
G II	340	57.23 %
G III	178	29.96 %

Efectos adversos

fiebre = ó < 38.2 ° C	Difícil de valorar	
urticaria, rash	3	0.59 %
dolor torácico	3	0.59 %
sangrado leve	12	2.35 %
Alteración de la coagulación	0	
TOTAL		3.53 %

(Se altera la coagulación en pacientes tratados con STK intrapleural?,
Estudio en 100 pac consecutivos 2007-2008)
Dra Bellapianta y col. Aba Vol 72 2008

Días de drenaje

G I	1 - 2 d
G II	2 - 5 d
G III	4 - 8 d

Días de internación (Dependió de la duración de la duración del trat, Atb EV)

G I	2 - 4 d
G II	4 - 7 d
G III	7 -14 d

Neumonía necrotizante Atb 29 días (n=40)

Indicaciones de cirugía

Persistencia de fiebre (sepsis)

No mejoría de clínica respiratoria

Fracaso del tratamiento

Aparición de otras complicaciones

n=594	**Cirugía**	12	2.02 %

Neumonía necrotizante Atb 29 días (16 / 40)

Mortalidad

5 de 905 pac 0.55 %

Ninguno tratado con STK

4 en el primer período GIII 51-55-60-88 días

1 en el segundo GIII > 50 días

PIVOT Trial

Pneumonia Intravenous Versus Oral Treatment Multi-Centre Randomised Controlled Trial Of Oral Versus Intravenous Treatment For Community Acquired Pneumonia In Children

M Atkinson, M Lakhanpaul, A Smyth, H Vyas, V Weston, J Sithole, V Owen, K Halliday, H Sammons, J Crane, N Guntupalli, L Walton, T Ninan, A Morjaria, T Stephenson
Department of Child Health, University of Nottingham THORAX 2007;62:1102

Se sugiere 10 a 14 días para neumococo y 21 días para S. aureus

Cuando tenga tolerancia por vía oral el antibiótico podrá administrarse por ésta vía

EMPIEMA PLEURAL Sociedad Argentina de Pediatría
Dr. Hugo Paganini 2010

TAIS

Tratamiento Ambulatorio de Infecciones Severas

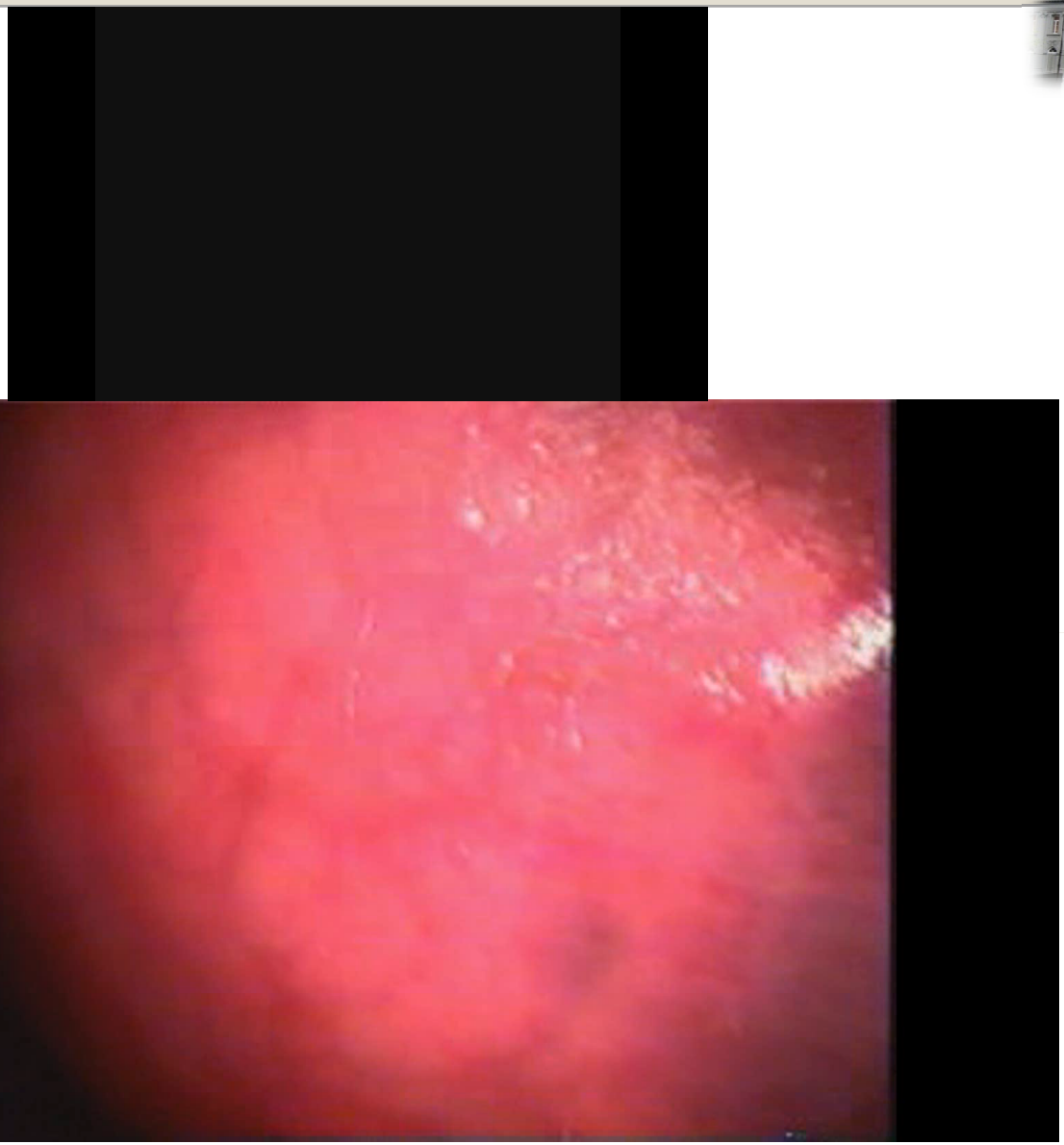
Conclusiones

En nuestra experiencia la STK es útil, efectiva, de bajo costo y de manejo sencillo, sin requerimiento de gran infraestructura

La estancia hospitalaria es corta

Presenta un índice de complicaciones bajo, ninguna de gravedad evidenciada por nosotros

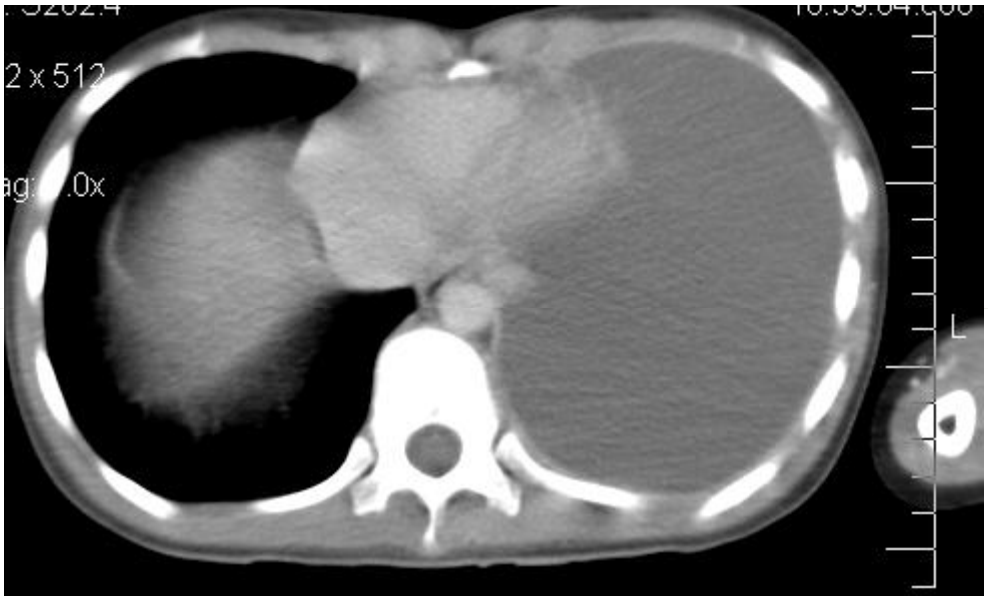
Alta tasa de éxito terapéutico sin la necesidad de procedimientos adicionales quirúrgicos

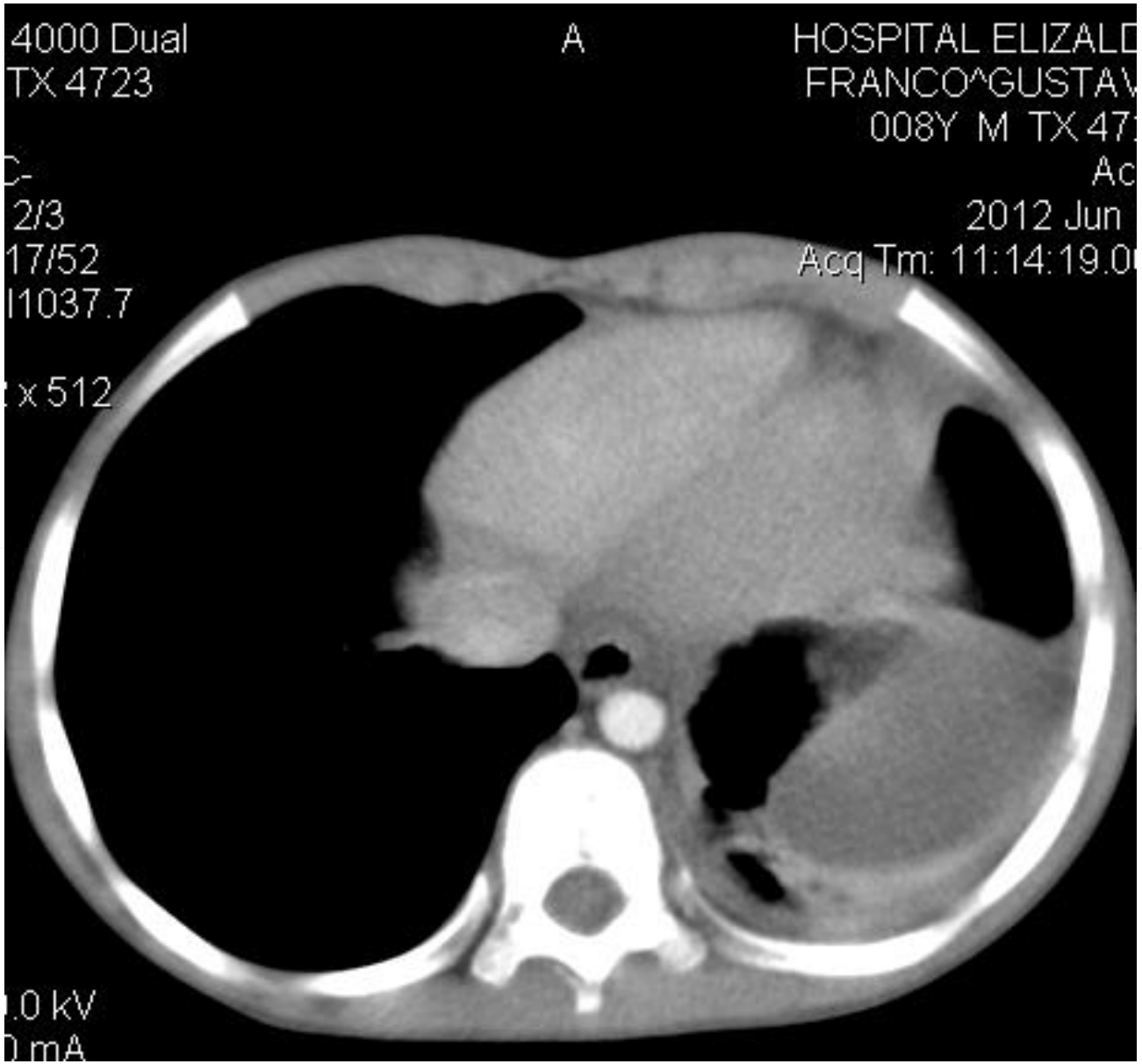


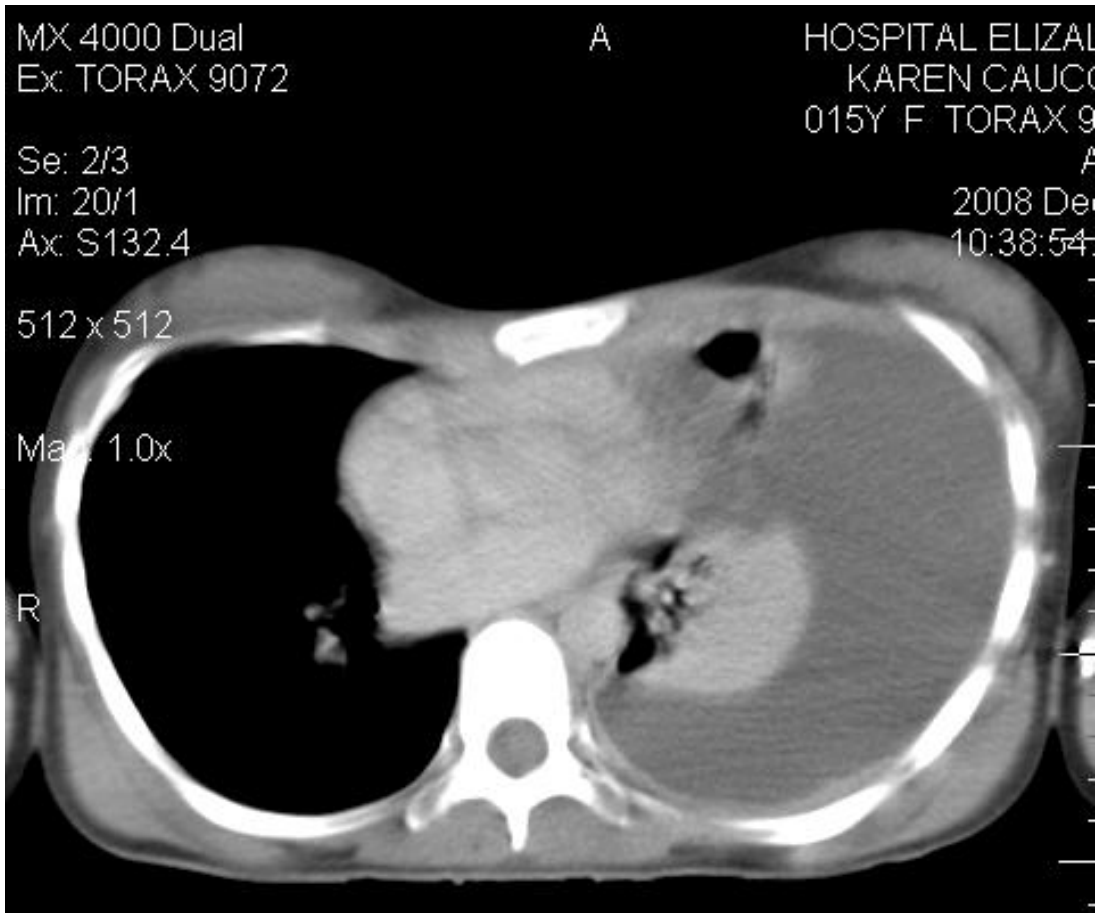
MUCHAS GRACIAS

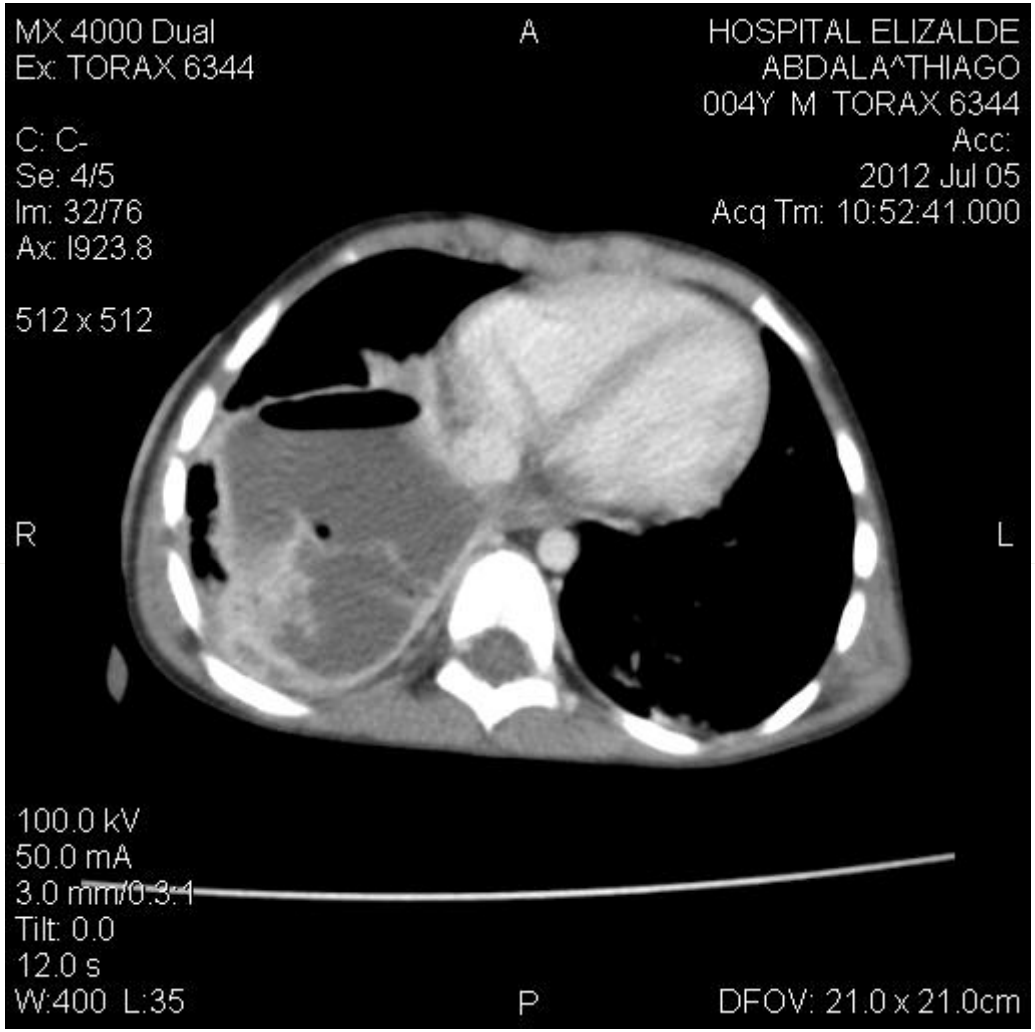
Duración de la fiebre antes de la admisión	4 - 25 d	11.8 d
Duración de la fiebre después de la colocación del drenaje	2 – 6 d	3.1 d

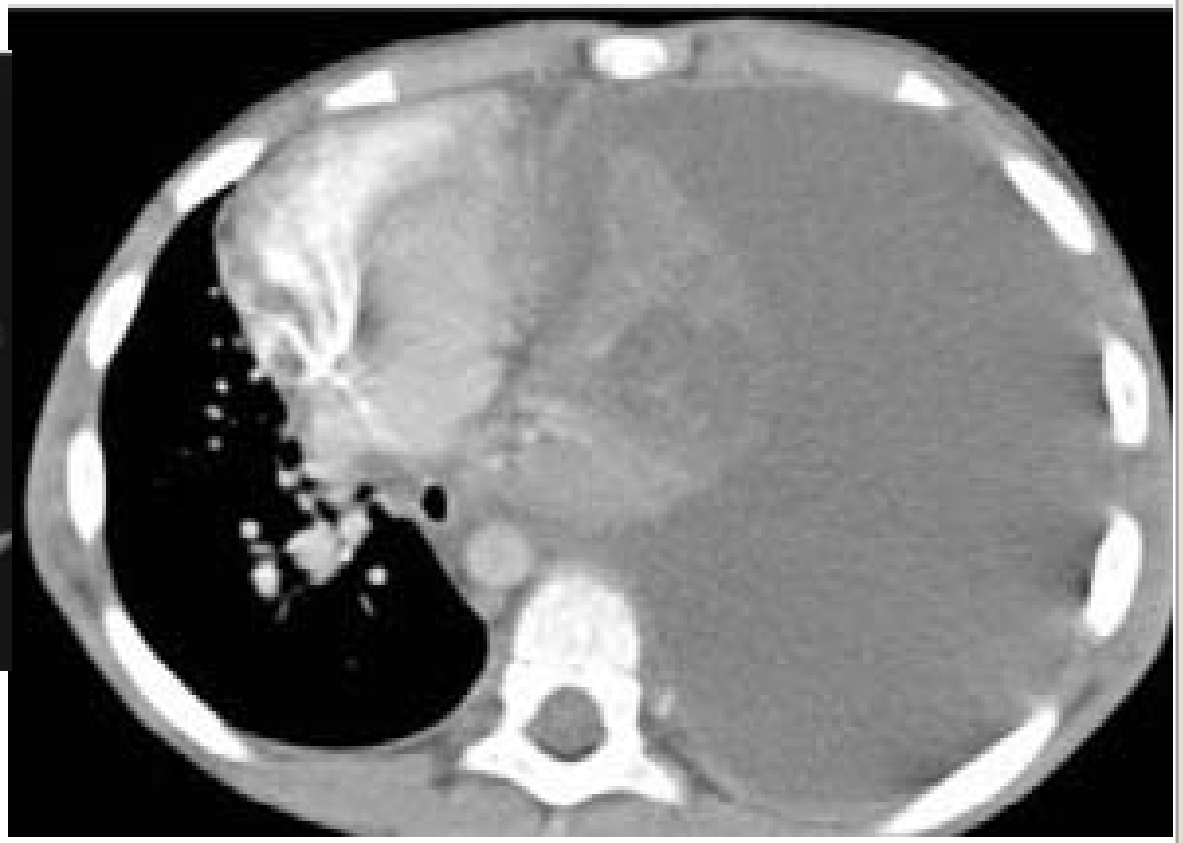
Neumonía necrotizante Atb 29.4 días (n=40)

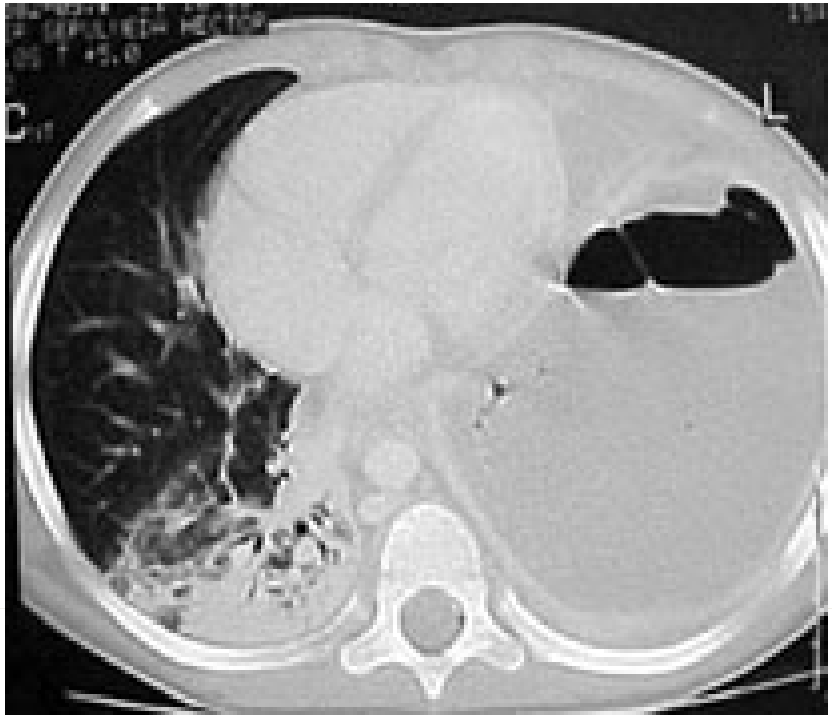

2 x 512
L

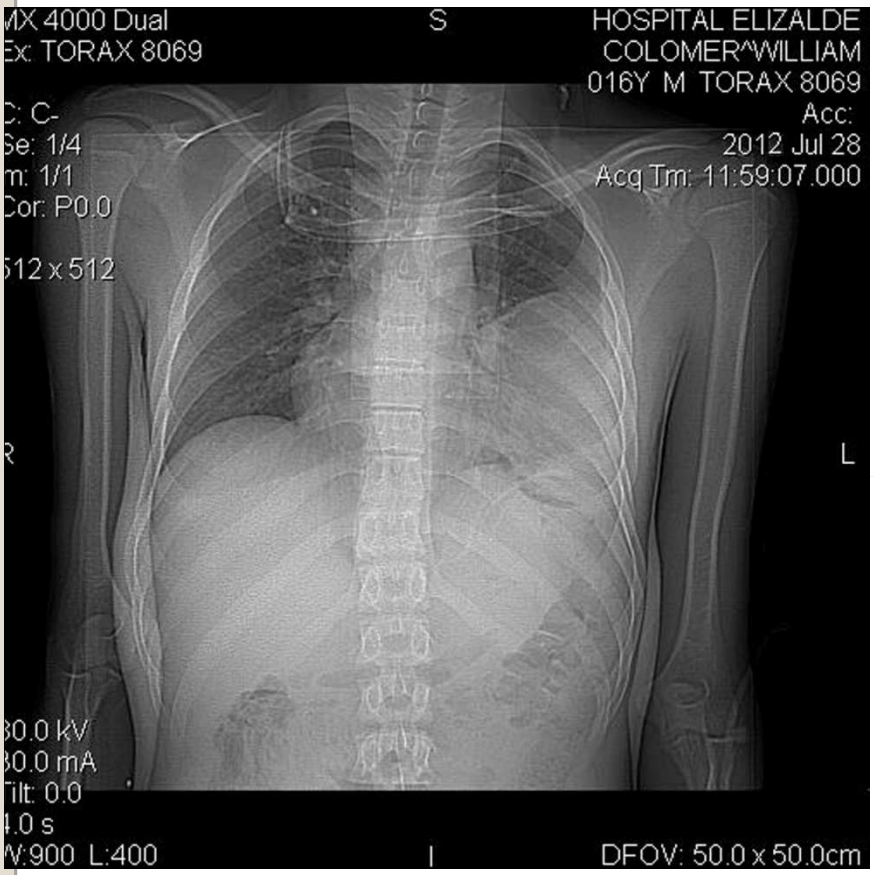

4000 Dual
TX 4723
A
HOSPITAL ELIZALD
FRANCO^GUSTAV
008Y M TX 47
Ac
2012 Jun
Acq Tm: 11:14:19.0
C-
2/3
17/52
I1037.7
x 512
.0 kV
0 mA

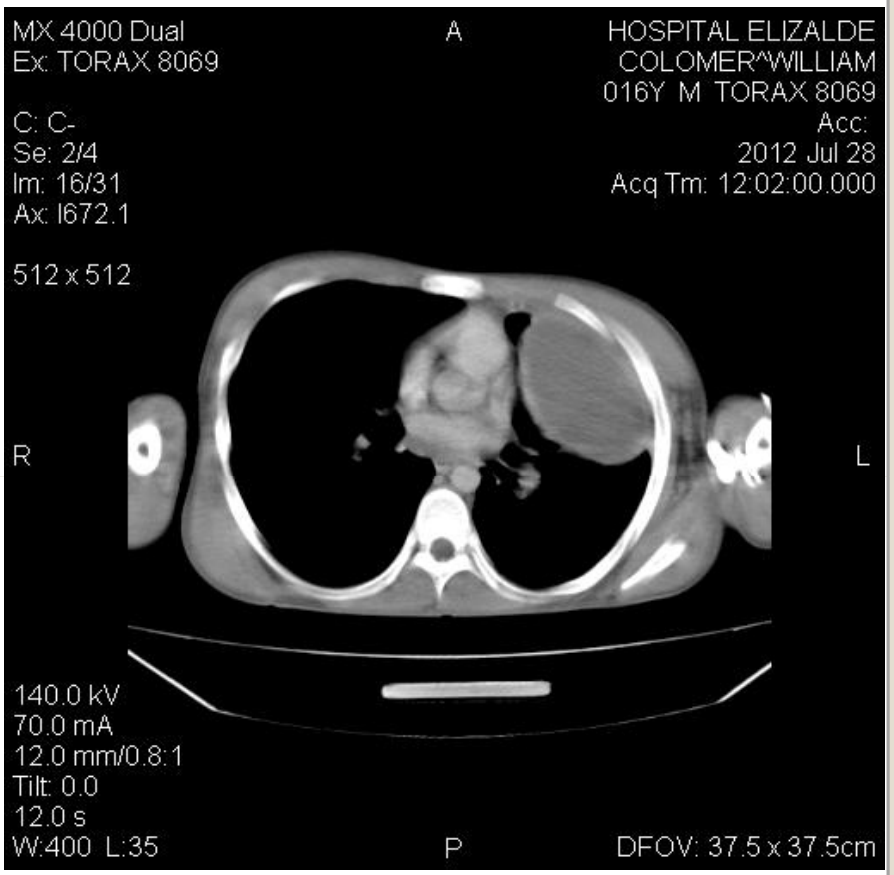

MX 4000 Dual
Ex: TORAX 9072
A
HOSPITAL ELIZAL
KAREN CAUC
015Y F TORAX 9
Se: 2/3
Im: 20/1
Ax: S132.4
2008 De
10:38:54
512 x 512
1.0x
R

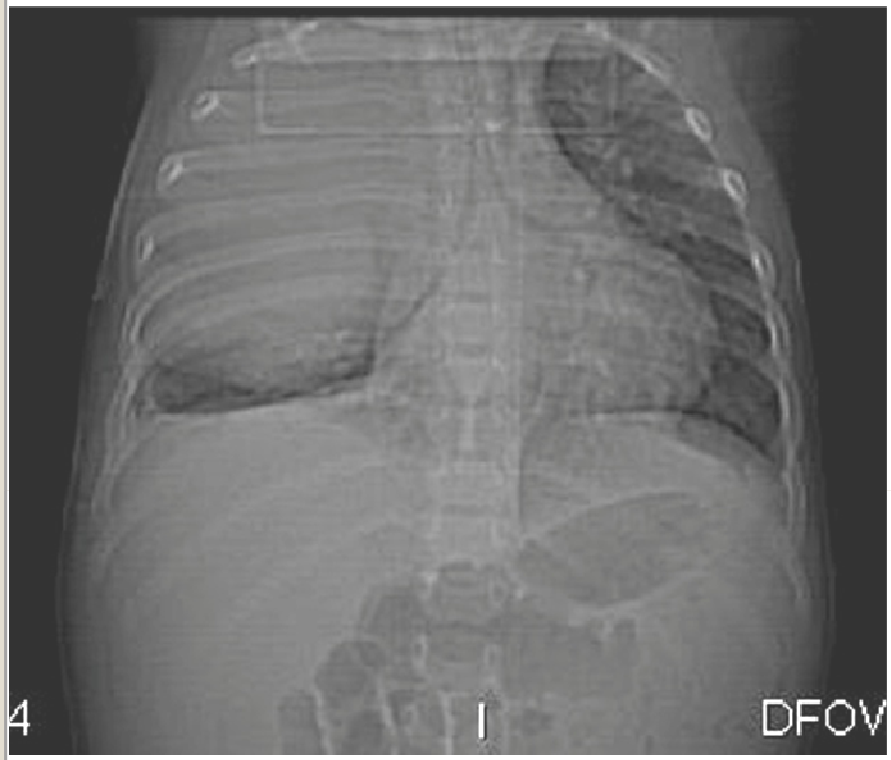

MX 4000 Dual
Ex: TORAX 6344
A
HOSPITAL ELIZALDE
ABDALA^THIAGO
004Y M TORAX 6344
Acc:
2012 Jul 05
Acq Tm: 10:52:41.000
C: C-
Se: 4/5
Im: 32/76
Ax: I923.8
512 x 512
R
L
100.0 kV
50.0 mA
3.0 mm/0.3:1
Tilt: 0.0
12.0 s
W:400 L:35
P
DFOV: 21.0 x 21.0cm

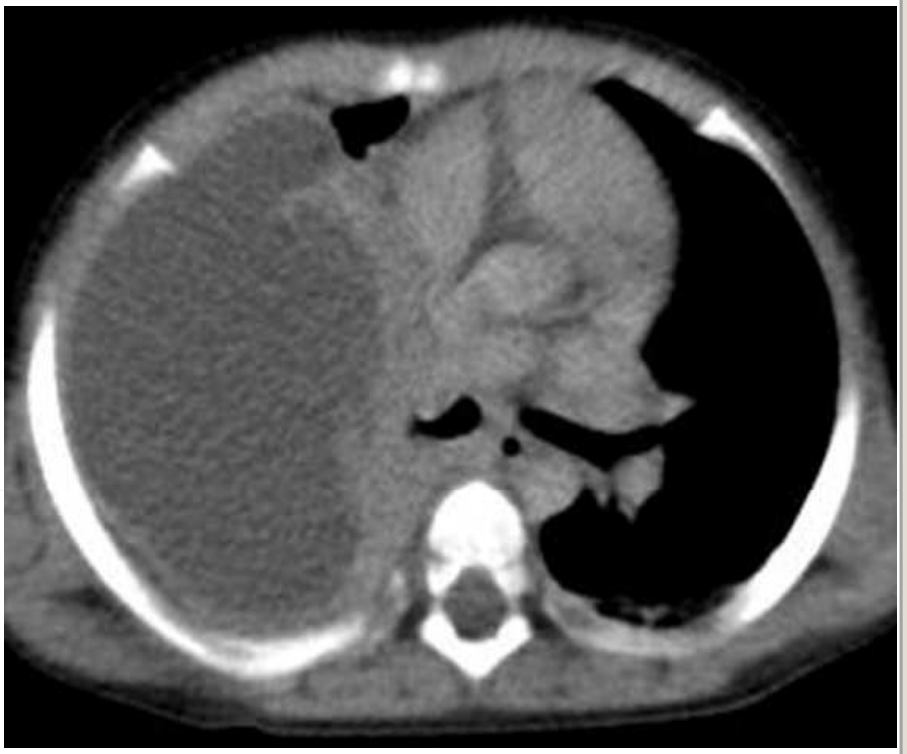





S
HOSPITAL ELIZALDE
COLOMER^WILLIAM
016Y M TORAX 8069
Acc:
2012 Jul 28
Acq Tm: 11:59:07.000
R
L
I
DFOV: 50.0 x 50.0cm


MX 4000 Dual
Ex: TORAX 8069
A
HOSPITAL ELIZALDE
COLOMER^WILLIAM
016Y M TORAX 8069
Acc:
2012 Jul 28
Acq Tm: 12:02:00.000
C: C-
Se: 2/4
Im: 16/31
Ax: I672.1
512 x 512
R
L
140.0 kV
70.0 mA
12.0 mm/0.8:1
Tilt: 0.0
12.0 s
W:400 L:35
P
DFOV: 37.5 x 37.5cm


4
I
DFOV



La evidencia sobre la cual basar las recomendaciones es pobre / ausente

Los datos del adulto no son trasladables

Los niños con empiema tienen casi siempre buenos resultados sea cual sea el manejo

En nuestra experiencia la STK en útil, efectiva, de bajo costo y de manejo sencillo la estancia hospitalaria es corta y con un índice de complicaciones menores y muy bajo 3.59 % (rash, dolor y sangrado leve) y con una alta tasa de éxitos.

BTS guidelines for the management of pleural infection in children

I M Balfour-Lynn, E Abrahamson, G Cohen, J Hartley, S King, D Parikh, D Spencer, A H Thomson, D Urquhart, on behalf of the Paediatric Pleural Diseases Subcommittee of the BTS Standards of Care Committee

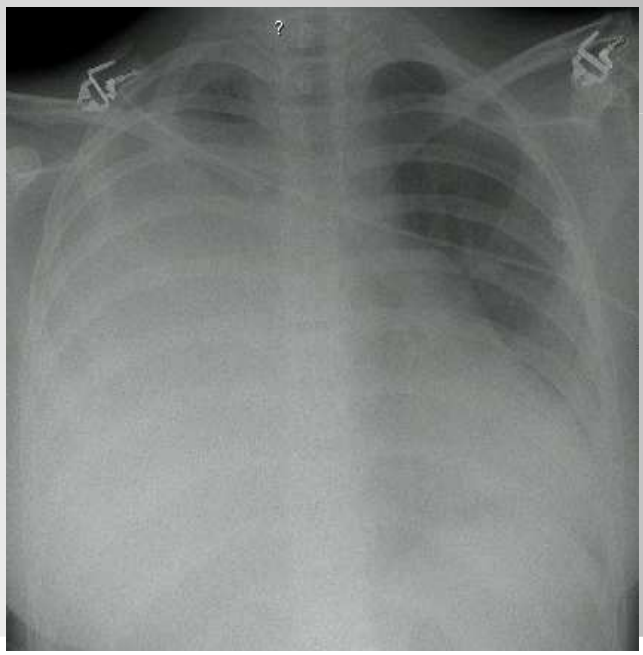
Thorax 2005;60(Suppl I):i1–i21. doi: 10.1136/thx.2004.030676

Postero-anterior or antero-posterior radiographs should be taken, there is no role for a routine lateral radiograph. [D]

Ultrasound must be used to confirm the presence of a pleural fluid collection. [D]

Chest CT scan should not be performed routinely. [D]

Diagnostic imaging



If GA is not being used, IV sedation should only be given by those trained in the use of conscious sedation, airway management & resuscitation of children, using full monitoring equipment. [D]

Since there is no evidence that large bore chest drains confer any advantage, small drains (including pigtail catheters) should be used whenever possible to minimise patient discomfort. [C]

Ultrasound should be used to guide thoracocentesis or drain placement. [C]

Chest drains

Intrapleural fibrinolytics shorten hospital stay and are recommended for any complicated parapneumonic effusion (thick fluid with loculations) or empyema (overt pus). [B]

Streptokinase should be given daily for 3 days using 10,000 /Kg units in 40 mls 0.9% saline for children aged 1 year or above. [B]

Thomson et al Thorax 2009;57 343-7

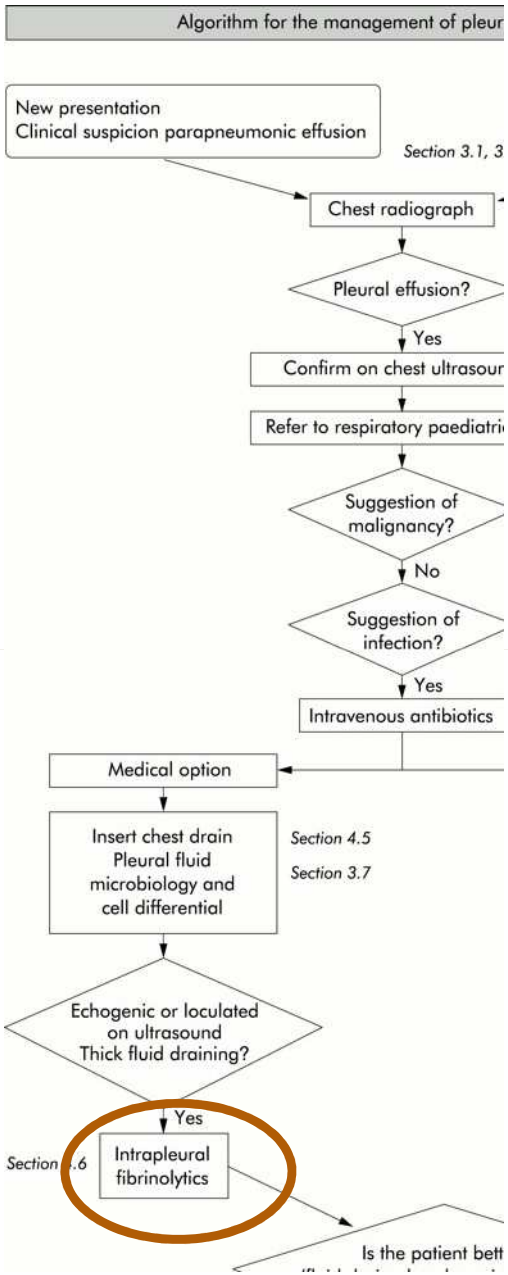
Intrapleural fibrinolytics

Patients should be considered for surgical treatment if they have persisting sepsis in association with a persistent pleural collection, despite chest tube drainage and antibiotics. [D]

Organised empyema in asymptomatic child requires formal thoracotomy and decortication. [D]

Estancia hospitalaria entre 7.2 y 9.4 días

Algorithm for the management of pleural infection in children.



Balfour-Lynn I M et al. Thorax 2010;60:i1-i21

©2010 by BMJ Publishing Group Ltd and British Thoracic Society

Chest drains: ongoing management

See the section below on the use of fibrinolytic therapy.

Good analgesia is extremely important. Children should receive regular paracetamol and NSAIDs; additional oral analgesia and/or morphine infusion may be necessary in some children.

Children with chest drains should only be managed on wards by staff trained in chest drain management.

A clamped drain should be immediately unclamped and medical advice sought if a child has any unexplained deterioration, becomes breathless or has chest pain.

If there is a sudden cessation of fluid drainage, the drain should be checked for obstruction (blockage or kinking); the drain may need to be manipulated or flushed.

If there is still significant remaining pleural fluid, and a drain is not draining, consider replacing it.

Consider obtaining further imaging (initially CXR and then ultrasound) if there is no clinical improvement and / or failure to drain the effusion. CT may be sometimes be useful – discuss with radiology and the surgical / respiratory team.

Consider removing a chest drain when: drainage is minimal (e.g. less than 30 mls per 24 hours) and there has been significant clinical progress alongside some radiological improvement.

Request a CXR approximately 4 hours after chest drain removal (see separate chest drain guidelines).

A bubbling chest drain should prompt the consideration of a bronchopleural fistula and discussion with the surgical team. Never clamp a bubbling chest drain.

2. Intrapleural fibrinolytic therapy (see separate Urokinase administration guidelines)

Intrapleural fibrinolytic therapy shortens hospital stay and should be used for all cases of parapneumonic effusion or empyema given intercostal tube drainage.

Further surgical intervention (thoracotomy or VATS)

Failure of chest tube drainage, antibiotics, and fibrinolytic therapy should prompt early discussion with the surgical team.

Children should be considered for surgical intervention if they have persisting respiratory distress, fever or sepsis in association with a persistent pleural collection.

Video-assisted thoracoscopic surgery (VATS) may be an appropriate alternative to thoracotomy. Early VATS, as a primary procedure, does not appear to offer benefit over a chest drain and urokinase, but is routinely used in some centres and in the US.

Fibrinolytic therapy is usually not used following VATS or thoracotomy.

Recovery can be rapid following thoracotomy; surgery may be an appropriate primary procedure in some children with a complex empyema, i.e. when there are extensive loculations, a thick pleural rind and severe lung entrapment in a sick child.

A lung abscess coexisting with an empyema does not usually require surgical drainage; chest CT is appropriate imaging when an abscess is suspected.

Abstracted bullet points

Clinical picture

N All children with parapneumonic effusion or empyema should be admitted to hospital. [D]

N If a child remains pyrexial or unwell 48 hours after admission for pneumonia, parapneumonic effusion/empyema must be excluded. [D]

Diagnostic imaging

N Posteroanterior or anteroposterior radiographs should be taken; there is no role for a routine lateral radiograph. [D]

N Ultrasound must be used to confirm the presence of a pleural fluid collection. [D]

N Ultrasound should be used to guide thoracocentesis or drain placement. [C]

N Chest CT scans should not be performed routinely. [D]

Diagnostic microbiology

N Blood cultures should be performed in all patients with parapneumonic effusion. [D]

N When available, sputum should be sent for bacterial culture. [D]

Diagnostic analysis of pleural fluid

N Pleural fluid must be sent for microbiological analysis including Gram stain and bacterial culture. [C]

N Aspirated pleural fluid should be sent for differential cell count. [D]

N Tuberculosis and malignancy must be excluded in the presence of pleural lymphocytosis. [C]

N If there is any indication the effusion is not secondary to infection, consider an initial small volume diagnostic tap for cytological analysis, avoiding general anaesthesia/sedation whenever possible. [D]

N Biochemical analysis of pleural fluid is unnecessary in the management of uncomplicated parapneumonic effusions/ empyema. [D]

Diagnostic bronchoscopy

N There is no indication for flexible bronchoscopy and it is not routinely recommended. [D]

Referral to tertiary centre

N A respiratory paediatrician should be involved early in the care of all patients requiring chest tube drainage for a pleural infection. [D]

Conservative management (antibiotics ¡ simple drainage)

N Effusions which are enlarging and/or compromising respiratory function should not be managed by antibiotics alone. [D]

N Give consideration to early active treatment as conservative treatment results in prolonged duration of illness and hospital stay. [D]

Repeated thoracocentesis

N If a child has significant pleural infection, a drain should be inserted at the outset and repeated taps are not recommended. [D]

Antibiotics

N All cases should be treated with intravenous antibiotics and must include cover for Streptococcus pneumoniae. [D]

N Broader spectrum cover is required for hospital acquired infections, as well as those secondary to surgery, trauma, and aspiration. [D]

N Where possible, antibiotic choice should be guided by microbiology results. [B]

N Oral antibiotics should be given at discharge for 1–4 weeks, but longer if there is residual disease. [D]

Chest drains

N Chest drains should be inserted by adequately trained personnel to reduce the risk of complications. [C]

N A suitable assistant and trained nurse must be available. [D]

N Routine measurement of the platelet count and clotting studies are only recommended in patients with known risk factors. [D]

N Where possible, any coagulopathy or platelet defect should be corrected before chest drain insertion. [D]

N Ultrasound should be used to guide thoracocentesis or drain placement. [C]

N If general anaesthesia is not being used, intravenous sedation should only be given by those trained in the use of conscious sedation, airway management and resuscitation of children, using full monitoring equipment. [D]

N Small bore percutaneous drains should be inserted at the optimum site suggested by chest ultrasound. [C]

N Large bore surgical drains should also be inserted at the optimum site suggested by ultrasound, but preferentially placed in the mid axillary line through the ‘‘safe triangle’’. [D]

N Since there is no evidence that large bore chest drains confer any advantage, small drains (including pigtail catheters) should be used whenever possible to minimise patient discomfort. [C]

A chest radiograph should be performed after insertion of a chest drain. [D]
N All chest tubes should be connected to a unidirectional flow drainage system (such as an underwater seal bottle) which must be kept below the level of the patient's chest at all times. [D]
N Appropriately trained nursing staff must supervise the use of chest drain suction. [D]
N A bubbling chest drain should never be clamped. [D]
N A clamped drain should be immediately unclamped and medical advice sought if a patient complains of breathlessness or chest pain. [D]
N The drain should be clamped for 1 hour once 10 ml/kg are initially removed. [D]
N Patients with chest drains should be managed on specialist wards by staff trained in chest drain management. [D]
N When there is a sudden cessation of fluid draining, the drain must be checked for obstruction (blockage or kinking) by flushing. [D]
N The drain should be removed once there is clinical resolution. [D]
N A drain that cannot be unblocked should be removed and replaced if significant pleural fluid remains. [D]

Intrapleural fibrinolytics

N Intrapleural fibrinolytics shorten hospital stay and are recommended for any complicated parapneumonic effusion (thick fluid with loculations) or empyema (overt pus). [B]
N There is no evidence that any of the three fibrinolytics are more effective than the others, but only urokinase has been studied in a randomised controlled trial in children so is recommended. [B]
N Urokinase should be given twice daily for 3 days (6 doses in total) using 40 000 units in 40 ml 0.9% saline for children weighing 10 kg or above, and 10 000 units in 10 ml 0.9% saline for children weighing under 10 kg. [B]

Surgery

N Failure of chest tube drainage, antibiotics, and fibrinolytics should prompt early discussion with a thoracic surgeon. [D]
N Patients should be considered for surgical treatment if they have persisting sepsis in association with a persistent pleural collection, despite chest tube drainage and antibiotics. [D]
N Organised empyema in a symptomatic child may require formal thoracotomy and decortication. [D]
N A lung abscess coexisting with an empyema should not normally be surgically drained. [D]

Other management

N Antipyretics should be given. [D]
N Analgesia is important to keep the child comfortable, particularly in the presence of a chest drain. [D]
N Chest physiotherapy is not beneficial and should not be performed in children with empyema. [D]
N Early mobilisation and exercise is recommended. [D]
N Secondary thrombocytosis (platelet count .5006109/l) is common but benign; antiplatelet therapy is not necessary. [D]
N Secondary scoliosis noted on the chest radiograph is common but transient; no specific treatment is required but resolution must be confirmed. [D]

Follow up

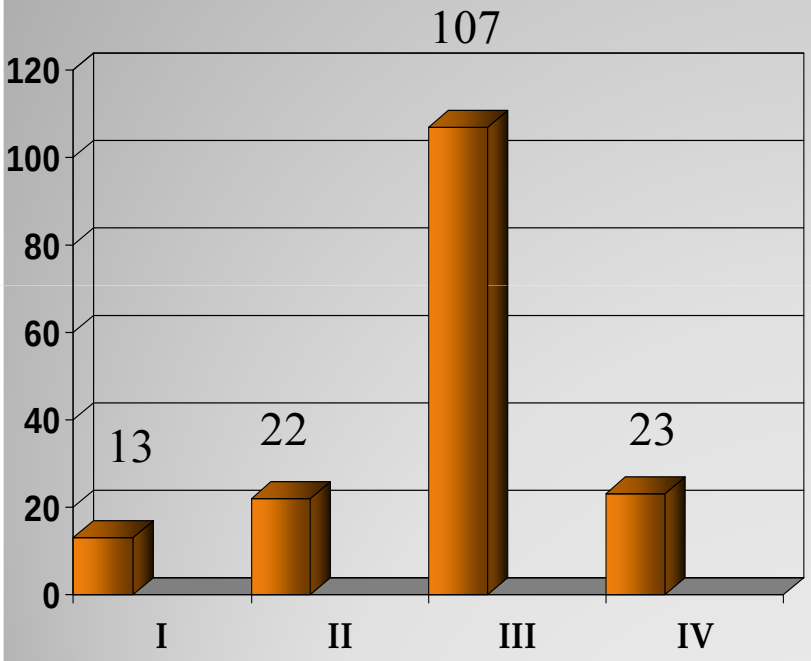
N Children should be followed up after discharge until they have recovered completely and their chest radiograph has returned to near normal. [D]
N Underlying diagnoses—for example, immunodeficiency, cystic fibrosis—may need to be considered. [D]

BTS guidelines for the management of pleural infection in children

Grados de recomendación

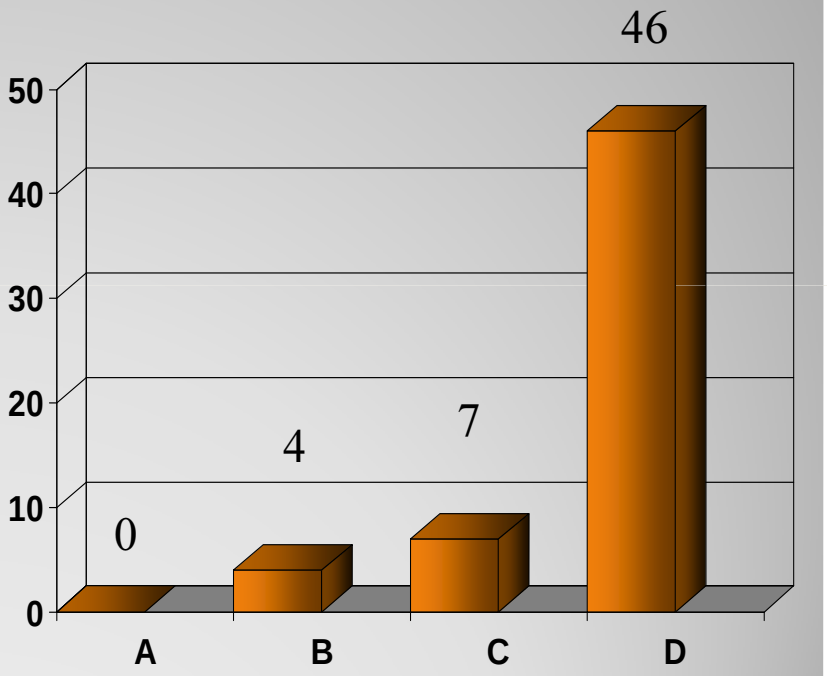
A: Basada en una categoría de evidencia I. Extremadamente recomendable.
B: Basada en una categoría de evidencia II. Recomendación favorable
C: Basada en una categoría de evidencia III. Recomendación favorable pero no concluyente.
D: Basada en una categoría de evidencia IV. Consenso de expertos, sin evidencia adecuada de investigación.

III: La evidencia proviene de estudios descriptivos no experimentales bien diseñados, como los estudios comparativos, estudios de correlación o estudios de casos y controles.
IV: La evidencia proviene de documentos u opiniones de comités de expertos o experiencias clínicas de autoridades de prestigio o los estudios de series de casos.



Levels of evidence

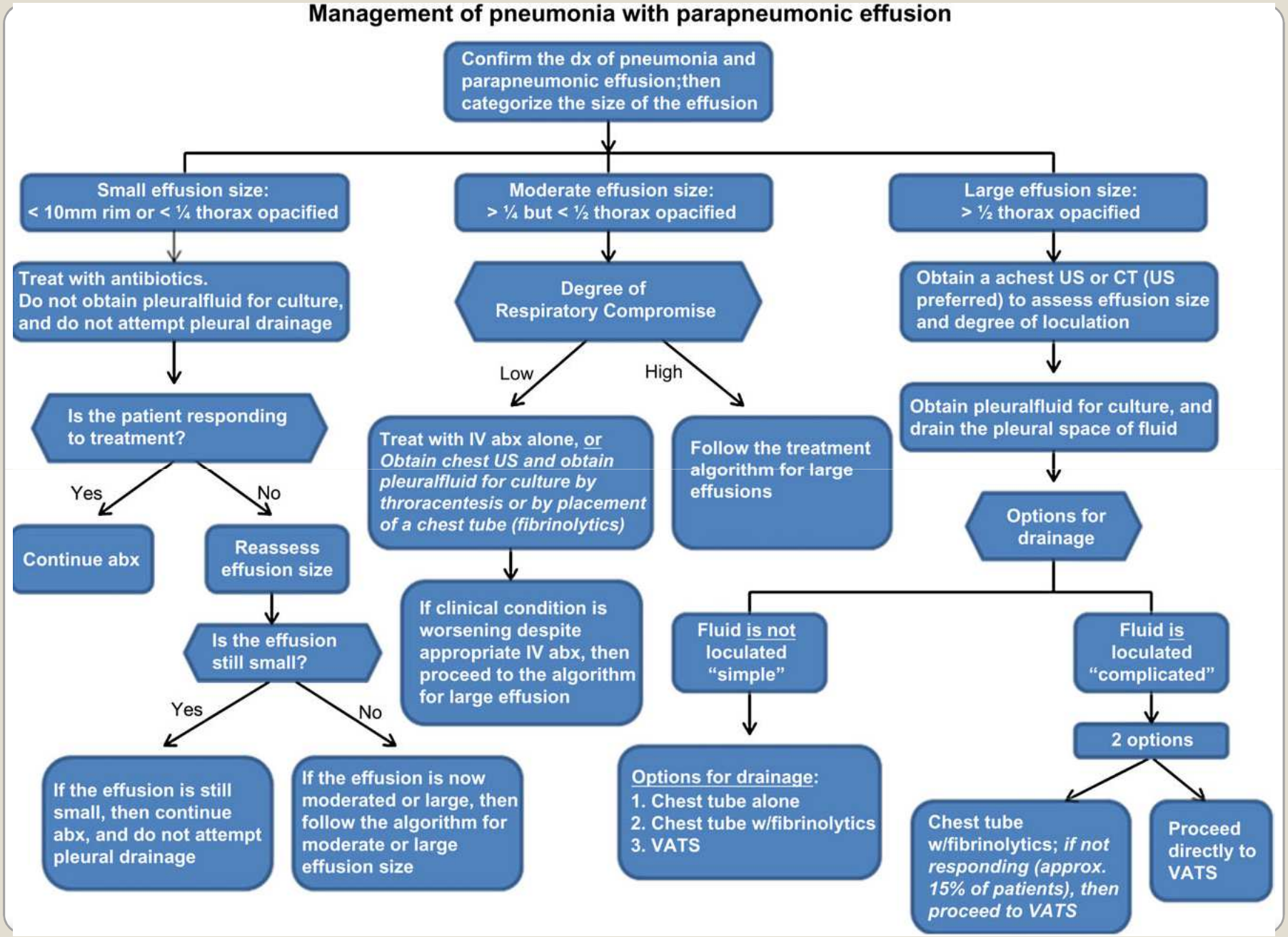
n=165



Grades of recommendations

n=57

SIGN ratings


Management of pneumonia with parapneumonic effusion
Confirm the dx of pneumonia and parapneumonic effusion;then categorize the size of the effusion
Small effusion size: < 10mm rim or < ¼ thorax opacified
Moderate effusion size: > ¼ but < ½ thorax opacified
Large effusion size: > ½ thorax opacified
Treat with antibiotics. Do not obtain pleuralfluid for culture, and do not attempt pleural drainage
Degree of Respiratory Compromise
Low
High
Obtain a achest US or CT (US preferred) to assess effusion size and degree of loculation
Is the patient responding to treatment?
Yes
No
Treat with IV abx alone, or Obtain chest US and obtain pleuralfluid for culture by throracentesis or by placement of a chest tube (fibrinolytics)
Follow the treatment algorithm for large effusions
Obtain pleuralfluid for culture, and drain the pleural space of fluid
Continue abx
Reassess effusion size
Options for drainage
Is the effusion still small?
If clinical condition is worsening despite appropriate IV abx, then proceed to the algorithm for large effusion
Fluid is not loculated "simple"
Fluid is loculated "complicated"
Yes
No
2 options
If the effusion is still small, then continue abx, and do not attempt pleural drainage
If the effusion is now moderated or large, then follow the algorithm for moderate or large effusion size
Options for drainage:
1. Chest tube alone
2. Chest tube w/fibrinolytics
3. VATS
Chest tube w/fibrinolytics; if not responding (approx. 15% of patients), then proceed to VATS
Proceed directly to VATS

Revised SIGN grading system: levels of evidence

I++ High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

I+ Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

I Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

II++ High quality systematic reviews of case-control or cohort studies. High quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is Causal

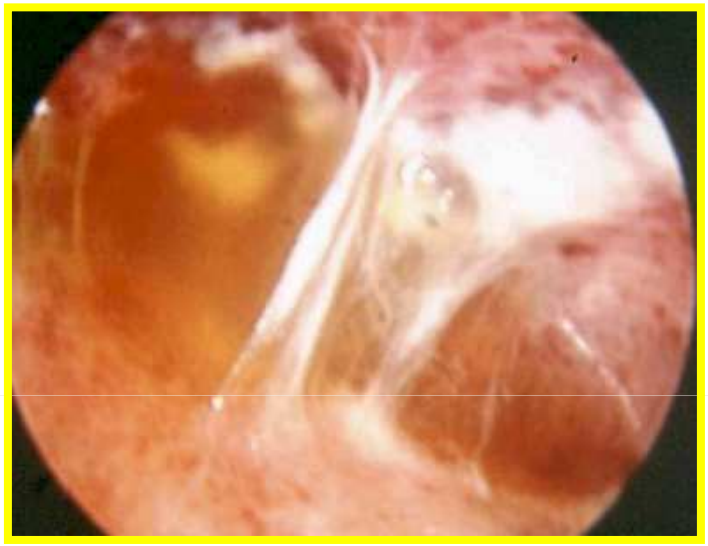
II+ Well conducted case-control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

II Case-control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

III Non-analytical studies, e.g. case reports, case series

IV Expert opinion

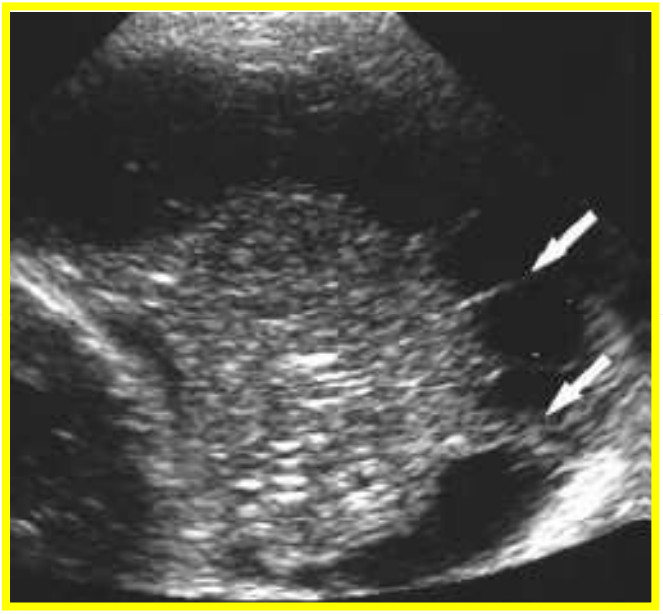
Balfour-Lynn, Abrahamson, Cohen, et al www.thoraxjnl.



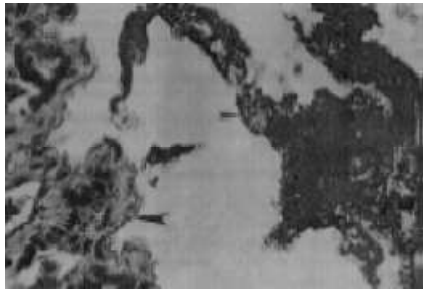
Cuál es nuestra situación actual ?

A qué desafío nos enfrentamos cuando hablamos de empiema ?

Imágenes



Fibrinolíticos



Streptokinasa

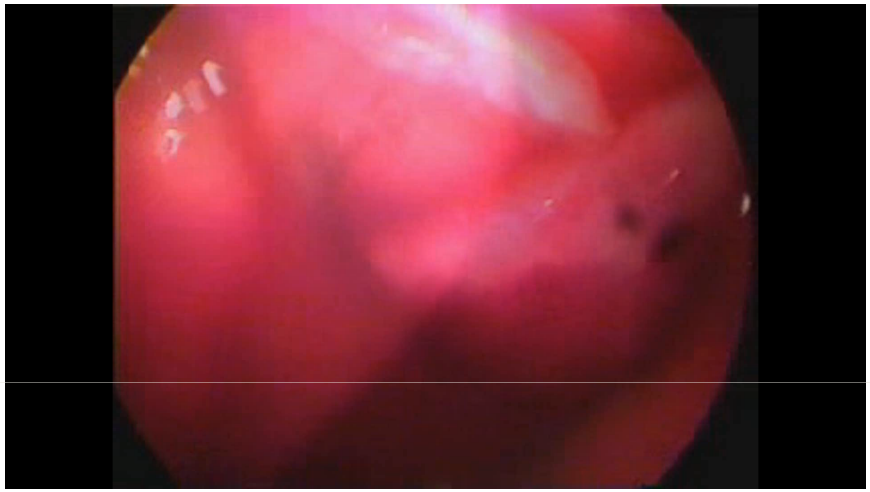
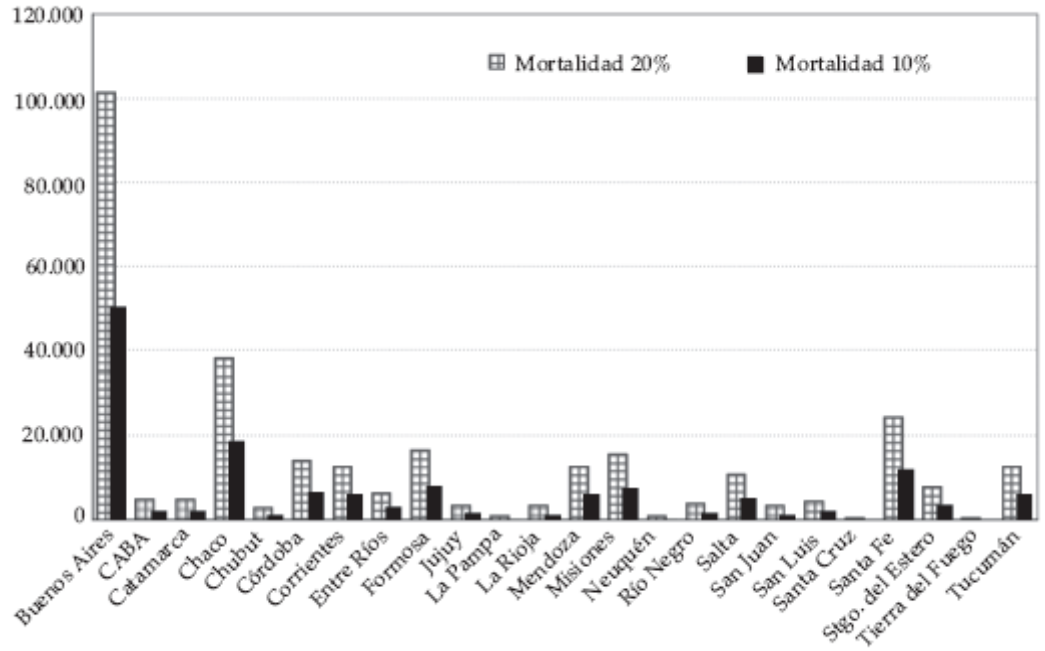
- Polipéptido estreptococo b_hemolítico grupo C
- Activador indirecto plasminogeno, forma complejos 1:1 con plasminógeno
- Chest 2004; 125; 566-571

Urokinasa

- Polipéptido humano tejido renal embrionario
- Activa directamente al plasminógeno
- Thorax 2002; 57:343-347

Alteaplasa (t-PA)

- Factor tisular activación plasminógeno, DNA recombinante
- Acción sobre plasminógeno unido a fibrina
- Radiology 2003;228:370-378, Pediatrics 2003;111.



52 % de los ingresos fueron de Pcia. de Bs. As.